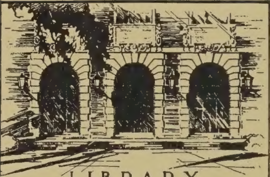

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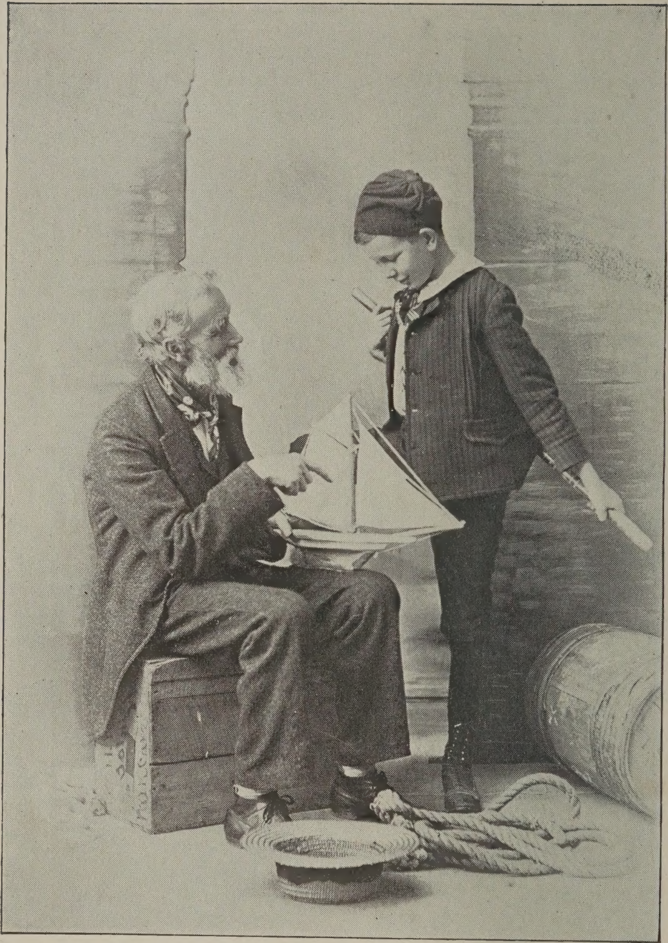
C. Ashleigh Snow, *N. Hatfield, Mass.*

A MISTY MORN.

Etched on copper by A. C. Austin's Adamantine Process, by the Albany Engraving Co., Albany, N. Y.



W. H. Kibbe, *Johnstown, N. Y.*

HOW THE RACE WAS WON.

(The Vigilant *vs.* The Valkyrie.)

Etched on copper by A. C. Austin's Adamantine Process by the Albany Engraving Co., Albany, N. Y.

PHOTOGRAPHIC
MOSAICS:

AN ANNUAL RECORD OF PHOTOGRAPHIC PROGRESS.

EDITED BY

EDWARD L. WILSON,

EDITOR OF "WILSON'S PHOTOGRAPHIC MAGAZINE," AUTHOR OF "WILSON'S PHOTOGRAPHICS," "LANTERN JOURNEYS," "QUARTER CENTURY," ETC.

THIRTIETH YEAR.

> "Wer vieles bringt wird manchen etwas bringen."
> "Who offers much brings something unto many."
> *Goethe's "Faust."*

NEW YORK:
EDWARD L. WILSON.
1894

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PREFACE.

THE readers of the thirtieth appearance of MOSAICS will find a few changes made, for the better, I trust. Last year a good deal of space was devoted in the illustrated department to telling and showing how to make pictures after the accepted rules of art. While that matter is not overlooked this time, yet the leading illustrated feature is made to show what can be done with pictures after they are made—much more good than is usually done with them. While photography is a precious pastime, its pursuit a maker of health, and its results a dear delight, still it is not made to reach far enough. We must make it go further—benefit more of our fellows. For this reason I believe Mr. Dresser's capital paper and its prime illustrations in Section IV. will be found very acceptable as well as interesting. It comes from a true artist and a good spirit. This, with Mr. C. Ashleigh Snow's paper on page 206 and his "Misty Morn" picture in the front, we are sure will create a more serious interest in hand-camera work than has grown

AG 10'53 BD

out of the common use of the "press-the-button" camera.

With all its delights *good* photography is an affair all serious, and is worthy of all the consideration that can be accorded it. With the same end in view Mr. W. H. Kibbe's capital genre picture is presented. It is of a class that should have more attention. Scenes which abound around about us, all of every-day life and of common-place subjects, touch the heart more and are more picturesque, to say nothing of being more easily possible for the camera, and are far more worth trying than is the portrayal of poetic imaginings by means of some efforts we have seen, questionably called "pictures."

Let us *think* and do our best—and do more.

What wonderful things photography has done since the last year; and how *splendidly* its enthusiastic votaries have helped us form all into another MOSAICS, I must ask you to find out by diligently perusing the pages which follow.

EDWARD L. WILSON.

NEW YORK CITY, December 1, 1893.

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PHOTOGRAPHIC MOSAICS,
1894.

SECTION I.

THE REVIEW OF THE YEAR.

THE PHOTOGRAPHIC HARVEST OF 1893.

THE year 1893 has been one characterized largely by failing crops—attended by most extensive and vigorous seed-planting. The crops have failed for various reasons—on account of defective materials used; because of unskilful planting; for the reason that indifferent cultivation followed the planting, and that proper advantage was not taken of the prospects presented. Added to all these is that old-time malady which has hung over us so long, namely, the want of faith in our profession and the lack of cohesion among the members thereof. You may say I have "ding-donged" at you "after this fashion for twenty-nine years, and now you begin the thirtieth with the same old funereal tone." But I dare not care too much for what you say. I believe it is better to move than to stand still, and that one will thrive better in a funeral procession than lying in a rut—the gutter, for example.

Let us look back upon the past year, then; retrospect it thoroughly and get what good we can out of it; then wipe our eyes, and look cheerily forward to the product of the seed that has recently been planted for us. The World's Columbian Exposition, the Con-v-en-tio-n and the auxiliary *must* all produce something for us. It takes a good deal of grace to make this assertion, I admit; but it won't choke long, and I am *sure* there is a better year ahead, the Exposition, the Con-v-en-tio-n and the auxiliary, nevertheless; snubbing and chastisement do good even to photographers. Lessons are always to be found in them—for help and for good.

Gathered from the fields of the workers all over the world, I have been enabled to shape what follows for MOSAICS 1894. There is more in it than what precedes has led you to believe, perhaps.

HISTORICAL.

Much interest attaches to certain documents relating to the discovery of photography, edited by Dr. P. N. Arata, and published during 1893 by the Museo de la Plata, of Buenos Ayres. These documents comprise two letters written by Niepce to Daguerre in 1827, a record of the basis of the partnership formed between Niepce and Daguerre in 1829, and two later contracts between Daguerre and Niepce's son in 1835 and 1837 respectively, after the death of

Niepce the elder. It is probable that these documents originally belonged to Daguerre, and were given by him to Arago, to enable the latter to introduce and support Daguerre's claims as the discoverer of photography before the world and the Academy of Sciences in that memorable session of January 7, 1839. These claims, it will be remembered, were disputed as soon as published by the English physician Talbot, who is now acknowledged as the inventor of photography on paper.

M. Blandin, writing in *L'Amateur Photographe*, asserts that these documents prove Niepce's share in the discovery of photography to have been greater than has been hitherto acknowledged. The merit of the discovery, as is known, lay in the guiding to some means whereby images obtained in the camera could be fixed. Regarding this claim the words of Article I. of the deed of partnership between Niepce and Daguerre (1829) are clear in giving priority to Niepce. The extract says:

"There shall be between Messrs. Niepce and Daguerre a copartnership under the name of Niepce-Daguerre, for co-operation in the improvement of the said discovery (spontaneous reproduction of the images received in the camera) *invented* by M. Niepce and *perfected* by M. Daguerre." Other articles in the contract justify also the assertion that Niepce had *discovered* a new method of fixing, without having recourse to the pencil, the views presented by Nature.

Dr. Arata, after mature reflection, says:

"If it be true that Niepce brought an idea already formed and results of some value, the final result, essentially modified and presented in a practical form, is the work of Daguerre; and this appears in a clear and precise manner from the declaration of Niepce's son, who affirms it categorically in the additional act of May 9, 1835, and in the contract of June 18, 1837."

The error committed by Arago, in his communication of the matter before the French Academy, seems to have resulted from adhering too closely to the narrative of Daguerre, instead of personally investigating the merits of the discovery.

Niepce, the elder, died suddenly July 5, 1833, without having had knowledge of the complete discovery of photography in the form afterward given to the world by Daguerre.

The conclusion of the matter appears to be that the glory of the discovery of photography with the silver salts belongs to Daguerre, while the discoveries of Niepce were confined to heliography, which has so many applications to-day, such as the production of photo-mechanical printing blocks, etc.

At the exhibition of the United Photographic Societies, held at Philadelphia last May, Mr. Julius F. Sachse exhibited a number of interesting reproductions of the earliest specimens of photographic work made in America. One of these represented the first heliograph made in Philadelphia shortly after the publication of Daguerre's discovery. It shows the Arsenal and the cupola of the old Philadelphia High School, and was taken by Joseph Saxton from a window of the U. S. Mint.

Mr. Sachse has recently published, in pamphlet form, a paper read by him before the April meeting of the Franklin Institute, Philadelphia, bearing upon *Philadelphia's Share in the Development of Photography*, in which many interesting facts relating to American photography are related.

Among the exhibits of the University of New York at the Columbian Exposition was a daguerrotype said to be the first photographic portrait. It was taken upon the roof of the University Building in New York City by Prof. J. W. Draper, and represents his sister. The lady of whom it is a portrait still lives at the age of eighty-seven, and a recent portrait of her was exhibited at the Fair alongside the daguerrotype referred to.

PHOTOGRAPHIC RESEARCH.

Photography with the Light of Binoxide of Nitrogen and Bisulphide of Carbon.—The use of bisulphide of carbon in photo-spectroscopy has been known for some years, but its employment with binoxide of nitrogen for artificial lighting in photography has only recently been pointed out. The light is bluish and intensely actinic, its photographic power being much superior even to magnesium. The light produced is neither dazzling nor blinding, and is far-reaching in its effect. Here is the mode of procedure as given in the *Scientific American.* Despite its advantages, we do not believe it will ever become popular, on account of its tedious preparation and odious smell, together with the obvious dangers resulting from combustion: After having focussed and placed the sensitive plate, the objective is uncovered; then a lighted candle is brought near to a bottle of the capacity of one or two quarts (according to the size of the room), filled with binoxide of nitrogen, and in which have been previously poured a few cubic centimetres of bisulphide of carbon. Care must be taken to thoroughly agitate the liquid so as to completely saturate the gas. I advise operators to make this mixture of gas and bisulphide in the open air, and to bring the bottle well stoppered into the room before approaching the lighted candle. As the combustion evolves sulphurous acid, the bottle should be placed near a window opened at the time of lighting the mixture, or at the entrance of a door. The binoxide of nitrogen is prepared in the same manner as hydrogen: In a quart vessel with two tubulars, in which are placed thirty grammes of copper (in pieces) and one hundred grammes of a mixture of commercial nitric acid, and at least one-half of its volume of water; if the disengagement is too active, add water; if it becomes slower, add a few cubic centimeters of undiluted acid. The preparation is made in the open air, and in advance, as the gas will keep indefinitely. It should not be inhaled, as it is changed into red acid fumes as soon as it comes in contact with the air.

Photographing the Vowel Sounds.—Professor Hermann's photography of the vowel sounds, which was demonstrated recently at Liége, suggests several useful applications of photography for recording purposes, but it must be remembered that the photographing of sound vibrations is no new thing, very successful work in this direction having been done over ten years ago. A minute mirror can readily be attached to the vibrating part of a phonograph, and a beam of light from an arc electric lamp being reflected from this, the photographic record is obtained on a sheet of sensitized paper wrapped round a revolving cylinder.

Some Peculiar Properties in Gelatine and Silver.—Mr. Howard Farmer, in a paper read before the Photographic Society of Great Britain early in the year, points out certain remarkable properties observable in silver and gelatine, which may be usefully applied in photographic processes. He says: The first consists in the catalytic action of finely divided silver in the presence of gelatine and a solution of bichromate. When these three substances are brought into contact with one another the bichromate salt is reduced, and the gelatine by combination with the reduced salt is converted into the insoluble chromated form, precisely as is the case when dry gelatine and a soluble bichromate are exposed to light. In bringing about these changes the silver, so far as I have ascertained, does not itself undergo any change. A convenient means of observing this consists in preparing silver bromide gelatine plates, in which the gelatine is retained in a soluble form, and developing images upon the exposed plates with ferrous oxalate developer. On plunging the developed plate into a 20 per cent. solution of bichromate ammonium for a few seconds the gelatine in contact with the reduced silver becomes insoluble, and, after washing the image, presents the same relief as carbon prints do in water. Such films, after drying and re-wetting, can be squeegeed to insoluble surfaces and developed with hot water, giving well-defined sharp reliefs. This will suffice to show that herein we are afforded the means of obtaining for the chromium processes the high sensitiveness hitherto only obtainable with gelatino-bromide.

The second property referred to is of an entirely different character. When many salts, notably the bichromates, are dissolved in gelatine and the gelatine dried, if the quantity of salt contained in the gelatine be not too great, it does not crystallize out, but remains dissolved in the dry gelatine.

A gelatine film with bichromate gives a reticulation which is more or less greasy or gelatinous to the touch. But when a film such as I have described, after heating, is plunged into cold water, it breaks up into a surface quite free from any greasy character, and resembling more a rasp or file, so that it takes ink from a roller in a very different manner to the ordinary collotype film, and can, indeed, be printed from in a similar manner to an etched metal plate.

Hyposulphite of Ammonium.—At a recent meeting of the Société Française de Photographie, M. Labarre detailed the results of some experiments with hyposulphite of ammonium as a fixing agent. He recommended it for paper prints in preference to hypo, used at the same strength. It is more easily eliminated from the print, while it keeps better, and, if any deposit forms, filtration suffices to leave the efficacy of the solution unimpaired.

A New Light-Sensitive Salt.—Dr. Glatzel, of Breslau, after considerable investigation of the salts of sulpho phosphoric acid, has discovered a new compound sensitive to the action of light. This is mercury sulpho-phosphate, which is acid and extremely sensitive to light. Further details are looked for with interest.

Photography Without Light.—Capt. Colson, whose work in the production of pictures without the use of a lens is well known, states that a picture on albumen paper, of a bronze medal or coin, can be obtained by moistening the paper and placing the coin in contact with the sensitive surface. A reduction of the silver follows, and an image results in a few minutes, which may be toned and fixed in the usual way.

Flexible Glass.—The following is the formula given by *Science Illustrée* for a flexible substance as transparent as glass: Dissolve four to eight parts of pyroxyline in alcohol and ether in proportion of a 1 per cent. solution. Then add 2 to 4 per cent. of any non-siccative oil, as castor oil, and 4 to 10 per cent. of resin or Canada balsam. Coat a plate of glass and dry in a warm current of air at 50° C. This will give a sheet of durable, unbreakable, transparent substance, impervious to acids and alkalies, and less inflammable than ordinary collodion, and of any desired thickness or color. With zinc oxide it has the appearance of artificial ivory.

Photographic Study of the Sources of Light.—Following the work of M. Janssen in photographing the solar surface with exposures of gradually diminishing length, M. Crova has applied the same method to the standard Carcel light and the electric arc. The phenomena observable when the image of the electric arc was projected upon the focussing screen were of interest, but the conclusions reached were unimportant.

A New Fixer.—Last year Dr. Janeway presented in Mosaics a paper calling for renewed investigation in the direction of a new fixing (or clearing) agent. At the meeting of the World's Photographic Society at Geneva, in August, R. Ed. Liesegang put forward the claims of *thiosinamine* as fulfilling the requirements of an ideal fixer. The two objections to the use of hypo soda, its liability to produce sulphurous compounds in the presence of an acid, and the difficulties attending its elimination from the film of negative or print, are obviated by the use of *thiosinamine*. This new fixer is an organic substance resulting from a mixture of ammonia with mustard oil. It crystallizes in colorless, non-smelling crystals, freely soluble in water, and also in alcohol.

The aqueous solution removes the silver salt from gelatino-chloride of silver plates as readily as hypo-soda; slower, but as completely from gelatino-bromide of silver plates.

Chloride of silver paper-prints require but four minutes' fixing in a 1 per cent. solution. By the addition of 0.1 per cent. of chloride of gold we obtain a quick-working toning and fixing bath. Aristo prints toned in this bath have greater depth than platinum prints. For warm tones less gold is required.

What influence any thiosinamine left in the films through insufficient washing may have on the durability of the pictures I cannot as yet state definitely.

I have, indeed, prints but slightly rinsed after fixing, now twenty days old, that show no change whatever. Should they continue so, it would prove another great advantage over hypo-soda.

APPARATUS.

Unusual activity in lens-making and the production and marketing of papers for photographic printing seem to have made the year unprolific in novelties in apparatus. Of the few which deserve notice, *Norton's Cloud Shutter* heads our list. A detailed description of this shutter was given at page 226 of our *Magazine* (1893), and several fine studies secured with the shutter have appeared in the same. It is simple in construction, and can be easily adjusted to equalize the exposure of all parts of a view. The time of exposure is in a measure regulated by a series of disks which admit of lateral and vertical movement. Unsurpassed for fine cloud effects, it will be found useful also for all kinds of outdoor work and every kind of life-study involving representation of motion.

The Field-glass Camera is a novelty recently placed upon the American market. When closed the camera resembles exactly a field glass in case, and the exterior does not betray any sign of photographic apparatus. When the case is opened two small releases are pressed, which cause the case to divide and take the form of a conical bellows-body camera. It is arranged for ¼ plates, and the holders are extremely light. The lens is a rapid rectilinear, working between *f*/11 and *f*/16, with a fixed focus of about 4½ inches. The arrangement of the camera is extremely ingenious, and experienced workers praise its performance.

A Universal Lens-flange is another novelty which will be found very useful by both amateur and studio workers when on outdoor excursions or when testing a number of lenses. With this handy tool the trouble of front-boards for the camera, adapted for each separate lens, is obviated. They may be had in two sizes, each of which will accommodate many lenses.

An Interchangeable Lens System is a very useful helper for those photographers whose ambitions are larger than their purses. The system is contained in a neat morocco covered case, and consists of a number of mounted lenses of varying capacities, focal length, etc., and tubes of different lengths, by means of which many useful combinations may be made for widely different purposes. The system may be had in two sizes: No. 1, allowing of sixteen different combinations; No. 2, permitting thirty-two combinations.

A combined retoucher's desk and reception-room or spotting table, introduced recently, is something which should commend itself to professional photographers. When closed and not in use it appears as a neat oak table with green baize top; this top can be elevated at any desired angle for writing, spotting, or working up enlargements; still further elevated, it resolves itself into a roomy, sensible retouching desk, equipped with the various movements required for working large or small negatives. A drawer underneath completes the combination.

An Electric Retoucher.—Every year of late we have had to chronicle the advent of a new retouching device. This year Mr. A. S. Harry, an old Ohio worker, of large practical experience, comes forward with an electric retouching device, which appears to have many advantages in practice, giving a fine stipple, and allowing the worker to accomplish more work.

LENSES.

Objectives for Long-distance Photography.—Despite the apparent lack of interest evinced by photographers, many new varieties of tele-photographic lenses have been introduced since the last MOSAICS made its appearance. In our opinion, MOSAICS readers will do well to look into the merits of these new objectives, which, apart from the use for which they are primarily designed, viz., long-distance photography, are capable of application in many of the everyday branches of photographic work, such as architectural studies, large head portraits, etc.

Steinheil's Teleo-lens Attachment is a very convenient instrument for such work. As its name implies, it is not a complete objective, but simply an *attachment* adapted for use with Steinheil's Antiplanat, Series II., No. 4, or any lens by another maker which possesses the same capacities as that lens, provided that the lens used has a light intensity of not less than *f*/7, with full aperture. The angle of view of the teleo-lens combination is about ten degrees. The enlargement of the image (or degree of magnification) increases according to the extension of the camera bellows and the distance of the ground-glass from the lens.

Dr. Miethe's Teleo-photographic Lens is, with one exception, the only objective of this class imported, and therefore available. Mr. G. Gennert, of New York, who is the American agent for this lens, has had some experience with its use, and reports that it is entirely trustworthy and fulfils its special purposes in a practical way.

Dallmeyer's Teleo-photographic Lenses are made in two powers. The high-power lenses are a combination of this maker's portrait lens with the patent negative attachment. The moderate-power lens is a combination of Dallmeyer's Rapid Rectilinear and the negative attachment. Mr. Dallmeyer has also introduced a teleo-photographic detective lens, consisting of stereographic lens, 5-inch focus, combined with a negative lens of 2½-inch focus. This lens covers perfectly at *f*/10, and with a back extension of 5 inches only, gives an image as large as that given by a lens of 15-inch focus.

These lenses are now being much used by various European governments, and Alpine travellers find them an added power in their work.

The Tele-objective Panorthoscopique is a French lens of this class which seems to possess many advantages. It is very small and light in construction, and therefore adaptable for hand-cameras; it gives rapid and perfectly rectilinear pictures with considerable enlargement. In architectural work its use obviates many effects of distorted perspective, and its adjustment is easily regulated by a convenient rack movement and scale. For large direct portraiture it is especially useful, giving wonderful relief, and negatives requiring little or no retouching.

Parvin's Tele-photo Lens is the most recent of the series. This objective is contained within an ordinary lens-tube 2⅝ inches long, and requires no delicate adjustment previous to the ordinary focussing. It is rapid, has great depth of focus, and is rectilinear. Great covering power is claimed for it, and its capability in the direction of magnification of the image is said to be five times greater than that of regular objectives of equal diameter. Many of these claims are seriously protested against on the score of originality by opticians familiar with the work accomplished in this direction in Europe. Despite these disadvantages, which are purely theoretical, we have seen some very creditable examples of tele-photographic work produced by means of the Parvin instrument.

The Ross Concentric Lens, briefly mentioned in MOSAICS (1893), has attained wide favor during the year by its many useful properties. For outdoor, architectural, and reproduction work this lens must be recognized as a distinct power given to photographers. In our personal experience with it we have found it absolutely free from distortion, astigmatism, flare, and other similar defects of lenses of ordinary construction. It gives perfect definition, even with full aperture, over a flat field, and includes an angle of 75°, which renders it of service for interior work. Stops are not needed to secure marginal definition, and may therefore be used with considerable latitude to regulate exposure and depth of focus. With stop *f*/16, a pleasing, soft, diffused effect is obtained; but for reproductive work, where excessively sharp definition is desired, a larger stop than *f*/22 is not recommended. Many prominent workers at home and abroad, including Col. J. Waterhouse, W. K. Burton, W. J. Stillman, and Mrs. Barnes-Ward, have given careful study and testing to the concentric since its commercial introduction, and are unanimous in attesting its value in practical hands.

The Zeiss Anastigmats are now in general use in reproductive work in Europe and our own country. Several new series (I., II., III.*a*) have been placed on the market during the year. The lenses of Series II. (doublets of five lenses) are intended especially for instantaneous exposures for outdoor work, and are very rapid, working at 1:6.3, and embracing a field of over 80°. Speaking of Series V., a well-known firm of process workers says: "We have tried the 'Zeiss Anastigmat, Series V.,' lens, supplied by Messrs. Ross & Co., during the month, and we are quite delighted with its capabilities for process copying. The No. 8 size, with an equivalent focus of 18½ inches, is guaranteed to cover 11¾ by 15¾ inches with stop *f*/36, but we found that it covered with sufficient sharpness a square of 17 inches with stop *f*/25. A line of small print placed in the extreme corners of this square was focussed just as sharply as when placed in the centre. A most crucial test was upon one of the printed line paper sheets for making screen negatives, and we secured a practically perfect degree of sharpness to the extreme edges. The lens is quite a tiny instrument in this size, even smaller than the portable symmetrical. The diameter of its largest lens is only one inch. We can strongly recommend it as the nearest perfection we can hope to get in lenses for copying."

A New Double Anastigmat has recently been announced by C. P. Goerz, of Berlin. A full description of this lens was given in *Wilson's Photographic Magazine* for September last. It is composed of two compound lenses, each anastigmatic, and both cemented triplets. In each combination a flint is inclosed between two crowns. One of the crowns has a higher refractive index than the middle flint, which insures freedom from astigmatism, while the other crown has a lower refractive index, by which means spherical aberration is eliminated or corrected. The astigmatism is corrected over the whole field up to the angle of 72°, and the image is perfectly flat. The two combinations are placed very near each other, insuring uniform illumination. At present the lens is made in two series: Series III., largest stop *f*/7.7, and Series IV., largest stop *f*/11. With full aperture, Series III. takes an angle of 70°; with a smaller stop, an angle of 90 is obtainable. Series IV. is intended for reproductive work.

The new objective is spoken of as a decided advance on pre-existing lenses, Dallmeyer stating that Dr. Goerz has arrived at a larger aperture, with flatness of field and greater rapidity than has hitherto been obtainable by opticians. It is undoubtedly an additional power in photographic work, especially where exact reproduction is in question.

To Separate Cemented Lenses.—It is often desirable to separate the elements of a cemented achromatic lens, and Mr. J. Traill Taylor, in the course of his lecture on lenses at the London and Provincial Photographic Association, mentioned how this can be done. Put the cemented lens in a saucepan of cold water, and gradually heat; it generally being unnecessary to heat as high as the boiling-point. A piece of wire gauze at the bottom of the saucepan and a wrapping of cloth for the lens are obvious precautions. When hot, the glasses may be separated, and may finally be cleaned with alcohol.

Van der Weyde's "Photo-corrector."—Early in the year the somewhat startling news came from England that Mr. H. Van der Weyde, of London, had discovered and put into practice a method of correcting the various kinds of distortion which so often make their appearance in portrait work. This is accomplished by the use of lenses of varied form before the plate during exposure. About a dozen corrector lenses are required for ordinary portraiture.

THE ART SIDE.

We photographers are getting on better terms with the "art critics," or rather they are viewing our works with less astigmatic spectacles. Some of them express quite a great deal of "feeling" for photography, and an obstinate one in London is said actually to have one of Prof. Emerson's photographs hanging in his "den."

Now, be it remembered that a number of definitions are given to the word "feeling;" but when we apply the term to the artistic we interpret it as meaning the understanding of things taken by the artist —the substance of his impressions.

Observable for some time has been the disposition on the part of the press to look favorably toward photographs as works of art, to visit exhibitions, and to give them a proper and generous share of comment in their columns. The kind of feeling, however, with which these exhibitions are considered is various—just as various as is the character and conceit of the genus Critic.

Another promising outlook on the artistic side is to be had in the growing tendency on the part of the members of the craft to critically examine pictures. Nothing will more surely make them grow. But they must *think* also—think away down to the root of things. Upon the development of the critical faculty all true progress necessarily depends. When a photographer knows and feels the art in his work he can express it—but knowledge precedes application.

THE EDUCATIONAL VALUE OF PHOTOGRAPHY.

Only where attention is especially turned to the subject can it be realized what a place in our literature the camera is making for itself. Besides the various magazines devoted to its interest, the others and the daily press are according to it increasing notice. Travel, biography, and a host of other subjects are effectively illustrated by its aid, both on paper and by means of lantern slides, giving pleasure and instruction to thousands. Aside from its scientific, artistic, mechanical, or any other side, its great and abiding value lies in a combination of them all its application to any and all of the arts and sciences as a means of the truest culture. There is a grand, noble power in the amateur's hands if he looks on his work as a means of education, and it could be most effectively utilized by keen-witted educators as a means of teaching young people. If the rising generation could be persuaded to use their eyes as a means of absorbing into their mental consciousness a keener sense of the beautiful world in which they live, instead of seeing life in a far less worthy sense, camera work will have won a right to high honor. It should have a place in every college course, notwithstanding the clamor which such a proceeding might cause. Someone must suffer by every progressive step in the world's education; but, after all, it is the greatest good of the greatest number which should be considered. As a mental and moral tonic, and a strong aid to general, broad culture, it is invaluable to those who have learned its power.

Believe in your work; honor it with faithful service, ever ready to see your faults and to correct them, remembering always the words of Longfellow, at once a reproof and an inspiration: "We judge ourselves by what we feel capable of doing, while others judge us by what we have already done."—MRS. H. SNOWDEN WARD.

LANDSCAPE WORK.

To a great many photographers who have little time for landscape work, and who, therefore, generally set out, camera in hand, with the avowed purpose of gathering in as many picturesque bits of Nature as they come across, regardless of chiaroscuro and all the other innumerable artistic possibilities in picture-making, the purely technical side of their work possesses more than ordinary interest.

The first question, naturally, concerns the apparatus, and especially the lens. In this matter I want to say a word or two about the advantages of single landscape lenses. In my opinion, despite the new Jena glass and improved construction of the more recent doublet and triplet combinations, with a single combination lens one can obtain more brilliancy, and especially a greater equality of illumination, than is generally secured where doublets are used. Fineness of definition with a comparatively large aperture is another advantage secured by the use of a single combination, which, as a matter of course, insures rapidity.

For all-round landscape work, however, doublet and triplet combinations possess distinct advantages which cannot be lightly dispensed with. Wherefore, to be properly equipped for the best results, both single and double combinations should be carried. In all cases where a double or rectilinear lens is desirable, by all means select one of the newer forms, such as the *Concentric*, or the *Zeiss*, Series No. III. These lenses, although working with more than usually small apertures, are as rapid as can be needed, give a wonderful amount of depth in proportion to the aperture used, and a perfectly flat field. In that class of landscape work where foreground effects are sought, the Zeiss lenses give results which I have not yet seen surpassed. For panoramic work the extreme angle Periscope has peculiar advantages, while it has many good points which commend it for general landscape work. The No. 2 Darlot lens, especially if the worker can secure one of the earlier numbers, is capable of splendid work, and is to be warmly recommended for use with the hand-camera.

When afield with the camera the temptation is strong to fire away indiscriminately at every pretty bit within range. The careful worker places his reliance chiefly upon choice of subject. As Mr. H. A. Mummery says in a clever paper upon outdoor work:

"This is of tremendous importance. In it is clearly shown the character and temperament of the individual, and its successful accomplishment depends much upon the spirit in which we go to Nature. Now, a young artist in choosing a subject naturally feels the limitations of his power; he tries to choose something that he thinks he can manage. But this is not the case with the young photographer; he feels no such qualms of conscience; his camera takes anything; therefore, he is apt to level it at the first thing he comes across, quite regardless of whether it will make a satisfactory picture or not. Now, it is a very important thing to recognize the limitations of one's craft. Not everything that Nature spreads out before us and charms us with, will please when reproduced on paper. We are impressed by the grouping of the leaves, or of the blades of grass, and the *orderly arrangement* of the clouds in the sky, and true art always longs to recognize this massing or direction, and to show the great laws which govern it. The most conscientious artist finds that he must leave out something or other, and woe betide him if he leaves out any of the important things. How much the photographer is able to manage this process of rejection I hardly know, but at any rate he should endeavor to choose subjects which are as broad as possible, and should avoid all broken effects, glitter and flickering lights, and so on. Nothing, I think, is more pleasing in Nature than springtime, with all its thin leaves flickering, pale sunshine, shadow dappled grass under the trees, all touchy and spotty, so fresh and young. But it is difficult stuff to make pictures of; you are so apt to overdo it."

Perspective is another detail of equal importance, but oftentimes neglected by the young photographer, full of faith in the truthfulness of his art.

When about to make a view, seriously, the photographer, even with a good light and a splendid subject, is often perplexed as to what lens to use and from what spot exactly to make his exposure. To prevent elongation of prominent objects in the composition he must not employ a lens of very short focus, and, if all things are not to be too contracted, a lens of too long focus must be avoided. Then, the worst bother of all, because the least under control, is the matter of proper height for the camera. If the standpoint is too low any faults of the short-focus lens alluded to will be exaggerated; the foreground will be offensively out of proportion to the rest of the view, and the perspective as a whole will be presented falsely.

Let us imagine a very thin glass plate placed between a landscape and *one* of our eyes (*one* of our eyes, as we are not now referring to stereoscopic views), and the centre of the pupil connected by straight lines with the several points of the landscape. Each of these lines marks a certain point where it strikes the glass plate. Now if we could apply to each of these imaginary points, color of the same quality and brilliancy in reference to our eye as is shown in the corresponding landscape prospect, then the glass plate would produce the same effect as the landscape itself. The picture must be in a vertical plane, and that we photographers can readily secure. This should all be regarded when one is about to make a picture; but it is true that a considerable deviation from the right distance does not, as might be supposed, interfere materially with the contemplation of a picture, for experience teaches us, and very decidedly, too, that the influence of the form of the picture is so vivid in our conceptions of it, that in even considerable deviations from the normal distance we still receive nearly the same impression as when standing at the proper distance. But only within certain limits is this true. It may be said, however, that in looking at a picture from an improper distance we still receive—through the influence of the form of the picture—an impression of the size and distance of objects in the picture approximating the one we would receive at a proper distance.

If this form of influence did not exist, then, on our bringing a picture of a landscape nearer to the eye the objects would also seemingly come nearer, and the relative depths of distance become less; and *vice versa*, when removing the picture away from the eye, the objects would seem to retreat with increase of depth.

Exposure.—Many schemes have been devised to aid the photographer in the correct estimation of the intensity of the light, of the color, of the atmosphere, and of other factors entering into the question of exposure, aside from the apertures of his lenses and the speed of his plates. Exposure meters, exposure tables and the like are calculated with the greatest precision, and one would think that such a thing as failure could not occur—the whole business seemingly being reduced to fixed laws, which, being fully committed to memory, would enable you always to arrive at the correct result. As to the exposure meters, I confess myself in ignorance of the method of their application except in a very general way, but it has always seemed to me that in order to use them intelligently it would tax the understanding as much as is required to make an off-hand judgment.

Exposure tables, giving the difference in the quality of the light at different times of the day and year, and under the different circumstances of being on sea or on land, in the woods or on the plains, are mostly a delusion and a snare—they only approximate, in a very general way, the differences. The exposure tables, however, in which are given the differences in the apertures of lenses as regards their focal lengths, and the proportionate exposure required for such differences, are of some use, for in this we have the only approach to fixed laws to work from. These rules are so simple that one can always carry them in one's mind, and they do not require any great application of mental effort to master.

By these rules, if you know one lens you know all lenses. For instance, if you find by careful measurement that your lens is ten-inch focus, and that the stop you mostly work with is $\frac{1}{4}$ inch in diameter, this is $\frac{1}{40}$ of the focal length, and is expressed by the term $f/40$; then, say for a certain plate, subject, and time of day you find you need to expose two seconds, this will be the key to all other exposures—giving more or less time to other subjects or at other times of day working with the lens at this stop. If, under the same conditions in which you made your two seconds' exposure, you used a stop of $\frac{1}{8}$ inch in diameter, then your time must be increased four times, and if with a large stop, of say $\frac{1}{2}$-inch opening, then your exposure will be but one-fourth as long as that needed for the stop of $\frac{1}{4}$-inch opening—for it is the law that the exposure increases or decreases four times with each increase or decrease of one diameter in the stop. All hand-books have these tables, and most lenses have their stops marked with the fractions showing the relation of their openings to the focal length of lens.—W. H. JACKSON.

Clouds in Landscapes.—A great deal *pro* and *con* has been written upon the securing or printing in of clouds suited to the varying peculiarities of our landscapes. Since Mr. H. B. Norton has introduced his Cloud Shutter among us we are of the opinion that the question is settled once and for all. The best and easiest way to get in a landscape negative the cloud and sky effects most suitable for the view is to photograph it at the proper time of day and season, with a Norton shutter, securing all you want on one negative at one time.

The basis of success in picture-making should never be forgotten. It is good composition, proper distribution of light and shadow, and the securing of atmosphere. Upon this basis all the best landscape of this and other years has been made; those who, like Prof. Emerson, have tried to reach success through "diffusion" and every other kind of dodge, have given the work up in despair.

HAND-CAMERA PHOTOGRAPHY.

The hand-camera has become epidemic and breaks out everywhere. There is still some opposition in certain sections, and there is also a greater measure of respect for it in other sections. The opposition is temporary, and will pass; the respect for hand-camera work, however, is bound to increase.

It is a common and amateurish mistake to think that hand-camera photography is "the easiest sort of thing." No one who seriously attempts to get good views will attempt work with the hand-camera until a pretty good schooling with the tripod is first had. Precision can be acquired no other way. Everyone ought to have a hand-camera, and to know how to make it do its best.

"Amateurs lack knowledge of composition. Their eye is never trained to perceive the relations or proportions of things; and above all, the different aspects in which the subject is made to appear according to the point of view are not intelligently considered. The photographer must bear in mind that while it is not his eyes or hands which cause the rays of light to impinge upon the plate, yet it is only by his intelligence and judgment exercised in choosing the proper point of view for the instrument that a pictorial arrangement of lines is produced. As to size of the picture, 5 x 7 is considered the most artistic, and this is the usual size to which we enlarge hand-camera negatives.

"The horizon should be at or near the lower third of the plate. Speaking again of the view-finder, as in the previous paper: ruled in odd numbers of three, five, or seven, you will produce points of intersection which are always expressive.

"Draw the same lines upon your focussing screen and move the camera so that the centre, the weakest point of the glass, shall not be the point of interest. The range from camera to base of picture should, when possible, be about twenty paces to the spot where the picture begins. Mark this spot with a handkerchief or a wad of paper, and retire twenty paces and focus. The angle of your lens should not be too wide. Vision within the limits of the human eye—that is, what may be seen by moving the pupils, not the head—is as much as is desired for a complete picture. It is to the man and not to the means he uses that we must look for a good result. Then, too, one should photograph with an object. Select animals, if you will, or the trees common to your region, wayside weeds and vines, wild flowers, or the picturesque buildings encountered in your drives; these aside from regular landscape work.

"There is a field for photographs of scientific interest. Our technical journals frequently call for and pay well for such, and in the laboratories of our colleges these are in demand. During the out-of-door season try to make frequent additions to your special department. It will grow in a short time to be very valuable.

"Landscapes, river scenery, forest interiors, mountain views, storm effects, misty morning views, could be exchanged with city dwellers for instantaneous views of street scenes, along the wharves, yachting contests, etc.

"In hand-camera work for sunrise or sunset clouds, marine views, snap-shutter exposures on herds of animals or flocks of poultry, in many street scenes, and in nearly all female costume poses, orthochromatic plates are the only ones worth while to use. For cloud work and interiors non-halation plates can be had if one has the money to spend, but any plate can be quickly backed with the colored paper called steel-blue, coated with a thin solution of glycerine and sugar. It requires only the dark-room light, a squeegee, and a dozen plates can be dusted and backed in five minutes. Plates so prepared will lie for months in the holders unharmed. The glycerine and sugar present when the paper is removed for development aid this chemical process. The work from such prepared plates is vastly superior."—C. ASHLEIGH SNOW.

For cloud effects the hand-camera is one of the best imaginable helps. It is ever ready, and can be instantly changed, but such work needs a stead hand and aim.

The development of hand-camera negatives is distinct branch of work from the usual development and needs much more than ordinary care. Here is formula which may be recommended for instantaneous exposures:

Water	1000 parts.
Sulphite of Soda	120 "
Caustic Lithia	3 "

Dissolve in the order above indicated, and add

Paramidophenol	7 parts.
Yellow Prussiate of Potash	4 "

The Development of Hand-camera Exposures.—On entering the dark-room, screen off at least two-thirds of the light, then remove and dust the plates in the shadow of a box; dust each side, and mark upon the film with an aniline pencil the letter on the slide that is to cover the plate. When the plate is exposed the record-book shows all the conditions of light, distance, stop used, exposure given, and result. Snap-shutter plates should all be placed by themselves, for the development of instantaneous plates is conducted in an entirely different way from time exposures. Plates containing clouds in view should be again placed in a special box, that the operator may be ready with all appliances for cloud development, as nothing more elusive will be encountered. Clouds are printed, but it is advisable to secure the clouds present in the pictures, even if a second plate is exposed for these.

As to development: Orthochromatic plates should be started with a cover over the tray and a sheet of brown tissue over the lamp, until detail is well started. For all kinds of work pyro with eiko will be found most useful; eiko for starting, pyro for finish, and carbonate potash, with a little sal-soda, for accelerator. Start all snap plates with much water, little eiko, and be very cautious of your accelerator or alkalies. A slightly yellow or citrine negative gives good prints always on Aristo or albumen paper. Old developer, if kept in a small, well-corked bottle, is useful to start the plate gently, and it works in a mellow manner. If you have over-timed plates, and it is well to make assurance doubly sure by slightly over-timing on all tripod exposures, it is far better to give such plates a bath for two or three minutes in a 10 per cent. solution of bromide of potassium which is well diluted with water; then pour off, and some will remain in the tray, at least enough to act as a restrainer until one can decide how to modify the developer to suit the exposure.

Snap-shutter plates, if you feel doubtful about them, and all flash-light exposures should have, on the contrary, a preliminary bath of alkali in a 10 per cent. solution, in much water. If you force alkali on quick-timed plates, you will lose your negative. Take time, use plenty of water, reducer and accelerator, with a 50 per cent. solution of brains added, and success will, ere long, crown your efforts.

Vogel's eoside of silver plates are very fine for all color work. Cramer's, too, cost less, it is said. Eiko with hydro is the developer used for eoside plates. It is always well to wash well before fixing, and fix all plates in *two* baths. The first bath clears the film apparently; the second finishes the work. Filter constantly; keep graduates and trays clean, and, so far as possible, use each for its special chemical; two special hypo baths, one special cleaning dish, two developing trays.—C. Ashleigh Snow.

ARCHITECTURAL PHOTOGRAPHY.

There are two classes of architectural photography, viz., work done during or after construction, at the instance of architects, builders, or owners; work done in a general way, and intended for city views, historical souvenirs, law purposes, etc. These classes may be again divided into interior and exterior work.

The working conditions in all these classes are much alike. Apart from the apparatus needed, which varies in detail according to the nature of the work, the principal points of interest gather around the *lines*, *lighting*, *point of view*, and *arrangement of locality*.

In the matter of apparatus for exterior work, a sturdy, roomy-topped tripod, at least six feet in height and capable of varied adjustment, is essential. For interior work the best camera support will be found in a step-ladder, which can usually be found near at hand. The camera should be square in form, with a reversible back; the bellows should allow of extension to twice the base-line of the plate used; back and front swing movements will be found convenient, and the front should also have a vertical movement, and a spirit-level or plumb-line indicator of some sort. Rectilinear lenses are essential for all classes of architectural work. The photographer will do well to carry with him an ordinary rapid rectilinear and a wide-angled lens. For half-plate or 5 x 7 work a lens of 7-inch focus will be found to fill all ordinary needs. Two good lenses for architectural work are the Ross Concentric and the Zeiss, Series IV. or V. Those who seek a cheaper lens can obtain an excellent instrument in Gray's Periscope No. 4, listed at $15, which has an equivalent focus of 8½ inches, angle 80°, and covers plates 5 x 8 to 8 x 10, according to the diaphragm employed. The chief thing in choosing or using a lens for architectural work is to get as far away from the subject as the locality will allow, and then use the longest–focus lens compatible with getting all the subject on your plate.

The management of lines in architectural subjects, interior or exterior, requires some little care. Much depends upon the choice of point of view. A careful study of the principal features of the subject will help. Perspectives need careful attention. It is important to preserve the parallelism of the vertical lines, and the point of sight must be always horizontal.

If it is impossible to get far enough away from the subject to include its highest points, a wide-angle lens will be necessary. Here care must be used or the vertical lines will converge unpleasantly.

To photograph a group of buildings, such as the collection gathered together at the World's Fair, is a much easier matter than short-range work. Here, again, an elevated point of view will produce the best result. For such work a long-focus lens of moderate angle, such as the *Concentric*, is most suitable. In such work lighting is an important matter. It would be useless to attempt to secure a pleasing view of a group of buildings upon a dull day. Relief is essential, so we must bring sunlight and shadow into our picture. Where it is possible, too, the surroundings should be composed to give as effective a background to the view as can be obtained. In a crowded city it is, of course, sometimes impossible to secure such effectiveness in perspective, but much can be done by intelligent selection of locality in placing the camera, and the choosing of the point of view.

There is another class of outdoor work connected with our subject, in which the photographer may show his artistic faculties—the photographing of country residences. To make *pictures* of such views is not a difficult task provided the photographer has some knowledge of composition and chiaroscuro. The point of view should be chosen to give pleasing lines; the lighting will require careful watching of the position of the sun in order to choose the proper time of day to secure effective opposition of light and shade; the tree-lined approaches need looking after, and the point of view chosen so that, if possible, they help to lead the eye toward the chief point of interest. Foreground must not be neglected, either in the photographing or in the trimming of the prints before mounting. And lastly, but not least, the sky should have attention. With such an excellent helper at hand as Norton's Cloud Shutter, the securing of an effective sky upon the same negative as the view is a comparatively easy matter.

The subject possesses more than ordinary interest from the artistic standpoint, but we have emphasized the bread-and-butter side of the question, believing that there are more profitable possibilities in that view of architectural photography than are generally realized.—JOHN A. TENNANT.

PHOTOGRAPHY AS A BUSINESS

Has not shown many signs of prosperity during 1893. We have passed through a season of close-fistedness in all matters of luxury, and with the rest photographers have had to be content with less than before. But complaints have not been as frequent as might have been expected.

If there is one fact more evident than another to the observant photographer of to-day, it is that the public, upon whom the photographer depends, is of two minds regarding portrait work. Either it wants portraiture at a low price, regardless of quality, or it seeks quality, in a measure regardless of the price asked for it. The lot of the mediocre workman, hopeless in almost any profession, becomes daily more and more desperate in photography. To our shame be it confessed, there are among us more mediocre photographers than either good or absolutely bad photographers. The business career of such a photographer is a pitiful struggle. At least one-third of our photographers would be in more prosperous circumstances to-day had they improved their possibilities as employés instead of rushing heedlessly into business for themselves, and so creating such keenness of competition that, with their restricted capabilities, there was left to them scarcely the slightest prospect of success. Discouraging though this may seem, it cannot be too strongly impressed upon the young photographer who is fondly contemplating the near prospect of getting into business for himself, that for many years to come there are better and brighter chances for him as a thoroughly skilled employé than he could hope to reach in a gallery of his own.

When professional photographers recognize the fact that success in trade must be reached through difficulties, and that the more difficult it is to reach success, the greater pull it gives them over the amateur, they will have more chance of prosperity. I think it is admitted on all hands that business is nothing like so good as it was in the wet-plate days. The introduction of easy processes has made photography anybody's business, and yet photographers continue to waste their time and talents in trying to produce minute improvements in a process that is already too perfect and too easily worked by anyone to leave them a living in it. I have preached for years that the process as it stands is quite sufficient for business, or, indeed, artistic requirements, and demands little or no talent to work. In fact, in technical photography, Jack is as good as his master. The future way to success will lie in the excellence of artistic results, not in the multiplication of processes

The Question of Prices Again.—If there is one thing more certain than another in the management of a photographic business just now, it is that the *worst* move a photographer can make is to reduce his prices. Yet hardly a month passes without its record of more than one worker who, temporarily discouraged by competition, or actuated by a selfish desire for more than the natural proportion of his local trade, reduced the price of his work. The after-records of such retrogressions possess a monotonous sameness. The photographer experiences a slightly increased volume of trade while the excitement lasts, then business falls flat, and he either loses all or is hopelessly crippled. The cut-price idea is a delusion, and the man who follows it rides to his downfall.

There is only *one* idea for the photographer who seeks to work out his business salvation in these times. We wish every photographer in America would "paste it in his hat;" it is this—

KEEP PRICES UP!

UNDER THE SKYLIGHT.

The growing earnestness evinced by photographers in pure portraiture is one of the most hopeful of the signs of the times. There is so much of fascination and enjoyment in the intelligent following of portraiture that we sometimes wonder how so many workers fail to find in it sufficient at once to satisfy their artistic aspirations and bring the needful bread and butter.

One of the best of the papers read before the Chicago Congress of Photographers was that by Mr. E. M. Estabrook, on "Posing and Illumination." Among other things, he says:

"The time is now past when any photographer poses and illuminates any subject without study and consideration. It is not the rule now to seat your subject carelessly before the camera and fire away, considering that any outcome must be a likeness, and therefore good enough. The light now furnishes the modelling and the lens cuts it in; therefore, the handling of the light and the use of the lens must receive the study and practice that are necessary to the skilful use of the pencil and brush.

"If the artist photographer has any appreciation of the line of beauty he will easily understand that in posing his subject under the skylight he should develop or bring into prominence the curve, rather than the angle, and that the centre of gravity should fall within the base. He should understand that symmetry and proportion should characterize his work, whether of the one or of the many, the single figure or the group. He must understand that in composition lines must have supporting lines when not perpendicular, and that a picture is unsatisfactory that carries no idea of firmness and support.

"The artist having these elementary principles constantly in mind will practically make a study of each face and form that comes under his studio light; viewing the subject or model from every direction and by every method of illumination; studying the face by front, three-quarter, or profile view, both toward and from the light; and also by the various arrangements of the light, such as broad Rembrandt or shadow lighting, or by any recognized method of lighting that the studio will admit of, that may impart character, form, or piquancy to a face or figure that may perhaps lack one or all of these graces when in repose, while abundantly interesting when animated by conversation or engaged in the common affairs of life.

"Every face will present some one view that will be more pleasing or interesting than any other. In this manner he will decide on that view that gives the most pleasing outline, and that method of illumination that gives boldness and brilliancy where features are small or insipid, or that tones down the harshness of a too rugged face without losing altogether its characteristic quality, for it is well to keep in mind that an indication of character adds as much to a portrait as does action or life to a pose, avoiding always the commonplace. Tameness in expression, pose, or lighting is contemptible, and will rob even the finest execution of every charm; at the same time an evident straining for effect in pose or lighting is objectionable to any refined taste, and should be avoided as strenuously as the other extreme, however true it may be that the daring innovator may sometimes produce charming effects that may not come strictly within the approval of a too cultivated taste.

"In my opinion, a resort to ultra effects is only justifiable in cases where the face and form of the subject are not amenable to ordinary methods, and when it may be desirable or profitable to experiment.

"When posing a single figure in either full or three-quarters, certain accessories may be used with good effect, but care should be exercised in making the model the central point of attention; everything should be subservient to the portrait. The three-quarter length will always be better without accessories unless in a sitting or leaning position, in which case the proper support will necessarily be provided.

"Groups of two or more require the exercise of common sense and a knowledge of the capabilities of light and lenses. In form the group should be as symmetrical as may be, with dark complexions and dresses placed next the light; and in large groups more attention should be given to the general than to individual effect.

"Many photographers shade their lights down closely and give long exposures; but the preponderance of opinion among artists of recognized ability is in favor of using all the light the model will bear, and make shorter exposures comparatively, thus obtaining bolder modelling, finer gradations, and more brilliant effects, while not losing the softness that is characteristic of all really first-class work."

NEGATIVE-MAKING.

To know how to produce a good negative is one of the essentials to success in the business of photography. When you have made a properly-timed, well-defined, clear negative, you have the only true foundation upon which, with retouching and printing, work can be made which will meet the requirements of good photography. There can be no set rules applicable to negative-making, either as to formulæ or manipulation. An experienced operator displays his individuality in his negatives, and the peculiar merits of his work are the result of the experience and ability which make up his individuality rather than the effect following the devotion to set rules.

Many theories are advanced as to the mode of constructing skylights. A sufficient volume of light is more essential than form or general construction. The shape, size, and quality of glass does not make fine negatives. A skylight 16 or 17 feet in height, with side light extending as close to the floor as possible, medium shade roller curtains, not too opaque, and a first-class man to utilize these advantages, are conditions favorable to good negatives.

To obtain a clear light effect it is well to work as far from the floor as possible. A chair of the ordinary height is generally too low to get the full value of the light. A posing-chair for bust work should rest on a platform as high as convenient. Timing plates properly under all circumstances and conditions of light is extremely difficult. For a safe method of timing it is well to use a slow plate for general small work—by no means a rapid one—and to use a medium diaphragm. The same diaphragm should be used at all times unless the light is extremely bad, or if the size of the head or the sharpness of the figure requires a change, as by the use of the same diaphragm you become better able to time your exposures more evenly, while a constant change invariably shows a variety of timing. Get accustomed to the rapidity of your plate and size of aperture when exposure is made, and you will find it profitable in many ways. (Small diaphragms are made principally for copying, and should not be used for any other purpose.) A good lens will give better results when not too closely diaphragmed. Rapid plates should not be used for general small work except in very bad light, as they are too sensitive to admit of a fair degree of certainty in timing. They are made principally to use where head-rests cannot be applied, as, for instance, figure work in motion, and children; for such work only can they be used with safety.

A cone should always be used on the lens in portraiture. For a 3B Dallmeyer lens the cone should be 16 inches in length and 14 inches in diameter at the front, or about that proportion, according to the size and real depth of the lens. Much of the inferior work made daily can be readily traced to carelessness in screening the lens during exposure. Bad reflections occur from floors and even walls, and a cone not only prevents such reflections from proving harmful, but is a positive help in obtaining clear images upon the plate.—J. Ed. Rosch.

Strengthening or Reducing Negatives.—We are indebted to Dr. Stolze, of Vienna, for the following method of strengthening or reducing an unsatisfactory negative: It is first to be completely bleached in a solution of equal parts blue vitrol 1 : 100 and bromide of potassium 1 : 100, then washed and developed with any good developer to proper strength.

Leaper's Negative-Reducer.—The following mixture, which any chemist will make up, forms a weakening agent very hard to beat:

Potassium Cyanide	½ ounce.
Water	10 ounces.
Dissolve and add	
Bromine Water	2 drachms.

A fixed, but too dense, negative placed in this mixture will be gradually weakened all over, and the weakening can be stopped at any stage by merely removing the negative and washing it. If a slight yellow stain results, the negative could be returned to the ordinary hypo fixing bath, and if this fails to remove the stain, the negative, after washing off the hypo, should be placed in a clearing solution made by mixing half an ounce of strong hydrochloric acid with twenty ounces of water.

The same mixture of cyanide and bromide will serve to weaken *portions* of a negative which are too dense, such, for instance, as white draperies in figure studies. To use it for this purpose the mixture should be applied with a brush to the portions of the *dry* negative which it is required to weaken, and when the action has proceeded far enough it can be stopped at once by washing the negative, clearing it as before if it has become stained.

It must not be forgotten that potassium cyanide is a deadly poison, for which reason the bottle containing the mixture must be kept in a safe place ; best of all, under lock and key.

Bromide of Potassium as a Restrainer.—Dr. Eder comments on a large number of new developing agents recently introduced, and points out that the student is very liable to generalize too much as to the action of bromide as a restainer, whereas, as a matter of fact, bromide acts very differently, according to the developer used. Some developers, like ferrous oxalate, are very sensitive to the restraining action of bromide, so that a few drops of a 10 per cent. solution to 100 cubic centimetres of the developer will produce a great restraining effect. Th restraining effect of bromide is also considerable i the case of pyrogallic and soda developer, while wit the pyrogallic and ammonia the bromide acts mor as a fog-preventer than as a simple restrainer. Wit this developer a normally exposed plate may requir thirty drops of 10 per cent. bromide solution for eac 100 cubic centimetres of developer; but in case o over-exposure these thirty drops may be increased t five or even ten cubic centimetres. Hydroquinone soda developer is less subject to the influence o bromide; hence it is not so desirable as ferrous oxalate, or as pyro or ammonia, in cases of over-exposure. Bromide acts still less as a restrainer in the case of eikonogen and metol; so that in these cases (also with amidol) very considerable over-exposure cannot well be dealt with by the addition of bromide.

To fix and harden a negative is sometime a desirable matter; the subjoined formula is given by Mr. G. Cramer as useful for this purpose. Prepare two solutions:

No. 1.

32 ounces Hyposulphite of Soda . . .	1 kilo.
3 quarts Water	3 litres.

No. 2.

1 quart Water	1 litre.
½ ounce Sulphuric Acid	15 c.cm.
4 ounces Sulphite of Sodium Crystals . .	120 grammes.
3 ounces Chrome Alum	90 "

After the ingredients are dissolved, pour No. 2 solution into No. 1. During the cold season, one-half the quantity of No. 2 is sufficient.

For convenience and reliability, Helmold's "Fireproof Mixture," a commercial article, will be found to fill such a need in the easiest and best way, without the trouble of preparation.

How to Avoid Coarse-Grained Negatives.—Speaking of this important detail before the Photographers' Congress at Chicago, Mr. M. A. Seed said:

"After years of observation, I have noticed that, as a rule, photographers make a better class of negatives during the cooler months than through the hot season. The grain of the negative is finer and the general appearance cleaner. The reason is that during the sultry days of the summer the drying of the negative takes several hours, the gelatine film becomes partly decomposed, allowing the particles of silver bromide to come together, they having an affinity for each other, the sack of gelatine which kept them apart being partially destroyed, forming coarse particles. The negative has then a woolly appearance.

"All negatives have the finest grain and appear the cleanest immediately after fixing. What we want is to retain this quality when dry. How shall it be accomplished during the hot season when everything is warm and the drying so prolonged? My method is as follows:

"I have a small ice-box for my developer made like this (illustration omitted), in which are the two stock solutions. When I mix the developer I take enough ice-water to bring it about 60° F. I first rinse out my tray with ice-water, then develop the plate; the fixing bath is also kept cool. If the water

I wash my negatives with is too warm I simply rinse with it, and allow the negative to soak in cool water in a grooved box about one hour, changing water two or three times. Then I rinse once more and put on rack to dry. Between this point and the time when the negative is perfectly dry it is liable to injury during the summer months, when the atmosphere is 90° or over, and often very humid, taking eight to ten hours to dry perfectly, thus changing the density and producing coarse grain. I have seen negatives that were developed, fixed and washed in the evening, having wet patches on them next morning. They were taken to another room to perfect the drying. The consequence was, where the drying commenced to be more rapid there was at once a change of intensity, ruining the whole lot.

"It is important, therefore, that the negative should dry as quickly as possible, in as cool and clean air as can be had. The best arrangement I have seen for this purpose is now being used by one of the most eminent photographers in this country, Mr. M. J. Stevens, of Chicago. It is a small electric fan, by the use of which the negatives can be dried in half an hour or less. Connection is made to a 16-candle lamp wire.*

"Just a word more as to another cause of coarseness. It may be produced by using a developer too strong in alkalinity. A strong alkali has the same effect upon the film as less soda with heat."

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* We would suggest "Helmold's Fireproof Mixture" as an improvement.—Ed.

NEGATIVE MANIPULATION.

The Stripping of Negatives and Reversing of Films.—The first requisite in this process is to render the film capable of sustaining the subsequent operations, which is accomplished by immersing the plate for one to two hours in a concentrated alum bath, afterward washing and drying it. When dry, in order to prevent its stretching later on, it is coated with a 2 per cent. collodion and placed in water till all greasiness has disappeared. While this is going on the following solution is prepared in a gutta-percha flask:

Water	1000 c.cm.
Hydrofluoric Acid	35 grammes.

When working with this acid care should be taken to protect the hands.

The negative must be left in this solution till the edges of the film begin to peel, when a well-sized thin quality of writing paper is placed on the film, removing all air bubbles. By means of this paper, to which the film adheres, the latter may now be lifted carefully from its support. It is now placed, film down, upon a newly coated collodion plate with gentle pressure, when the paper may be pulled off, leaving the film on the collodion plate, from which it is readily removed by cutting round the edges and lifting it off by one corner. Should the film be too thin, it is well to coat it with gelatine before the second stripping.—A. HELMOLD.

To Clear Veiled Negatives, or Yellow Fog.—We prepare the following mixture: Glycerine and water, equal parts, which has been dissolved in cold hyposulphite of soda to saturation (40–50 to 100). This mixture is spread with a brush over the yellow negative, then the plate is left on a plane surface protected from heat and dust. According to the intensity of the coloration of the negative, the yellow tint invariably disappears in a longer or shorter time, which may vary from one to twenty-four hours. The negative is afterward washed in the ordinary manner. Here, again, it is the *nascent sulphurous* acid, which acts on account of oxidation of the hyposulphite coming in contact with the air.

The method given above has already been indicated, but with a solution of hyposulphite in plain water, but it was found that the too rapid evaporation of the water gave to the surface of the gelatine incrustations of hyposulphite. The glycerine has precisely for its object to increase the proportion of dissolved hyposulphite and to prevent crystallization, even after a very long time. We have cleared by this process negatives that were so yellow that it was hardly possible to see the image, and which had been dry for more than two years.

Removal of Silver Stains.—The ordinary course is to use a weak solution of cyanide of potassium; but when, as is often the case, such stains are mainly on the surface of the gelatine film, the method of removal suggested by Mr. H. L. Webster may be adopted. He says: "Take a common rubber pencil-eraser, and with one edge lightly rub the stain; it will now disappear like magic, and no danger of spoiling the negative, or delay in printing of more than a couple of minutes."

Two Mexican photographers make known the fact that a negative can be intensified with mercuric chloride in the usual way, without any fear of staining the film, even when the negative has not been completely and thoroughly washed, if the negative, after fixing, is immersed for thirty seconds in a bath of chloride of sodium at 1 per cent.

A Copper-Silver Intensification Method.—Plunge the negative into a solution made as follows:

Sulphate of Copper	6 parts.
Bromide of Potassium	1 part.
Water	100 parts.

In this solution the image is bleached with more or less rapidity. The intensity obtainable may be graded by prolonging the time of immersion in this bath. When bleached, the negative should be placed in a bath of nitrate of silver solution 1 to 5, when it will acquire its natural color, with added strength.

Stripping Gelatine Negative or Positive Films without Stretching the Film.—For all who require reversed negatives or stripped originals, transparencies, etc., Dr. Eder's method will be found useful. Dr. Eder first collodionizes the plate—and it need scarcely be said that for this purpose a collodion should be used which gives a tough and horny film. When the collodion film has thoroughly set, but before it has dried, the plate is immersed in the following mixture:

Hydrofluoric Acid	1 part.
Water	10 parts.
Alcohol	10 "

In a few minutes the film begins to show signs o rising at the edges, and one corner of the film being now carefully gripped by a pair of steel tweezers, the corner is turned back, and the film is cautiously and slowly drawn off, the whole being kept beneath the surface of the liquid. The acid fluid is now poured off, and is replaced by water to which a few drops of ammonia have been added, after which a rinse is given in plain water.

To mount the stripped film, all that is necessary is to mount it in contact (under water) with a glass plate coated with a 5 per cent. solution of gelatine, the collodionized side of the film downward. When the film is desired in a free state it should be dried upon a glass plate coated with a repellant surface; a waxed plate answers this purpose.

The following is one of the best methods of waxing a glass plate: First, clean the glass thoroughly from all traces of gummy or mucilaginous matter, and then warm before a fire until so warm as to be well above the melting-point of wax. A lump of beeswax is now rubbed over the glass, and all excess is polished off with a pad of flannel. The film of wax remaining is of extreme tenuity, but, in order to get the plate into a reliable condition, several heatings and waxings may be required. Pure beeswax should used.

Zinc Tanks for Washing Prints and Negatives.—We know that the hyposulphite which is deposited at the bottom of zinc tanks used in washing negatives and prints attacks the metal. It results from this that the tanks are injured and that the prints attached to the bottom are spotted. These objectionable features may be avoided by a *varnish* consisting of 5 parts of bitumen of Judea dissolved in 100 parts of benzine. This varnish is spread as in collodionizing a plate, in artificial light; then the tank is exposed to sunlight, which renders the bitumen insoluble. It is well to give two coatings of this varnish and to renew the operations when it commences to wear off. For gelatino-chloride prints, which generally remain at the bottom of the tank, it is well to place at the bottom a wooden frame having a thickness of two centimetres, on which is stretched a network, retaining the prints in the portion of water not saturated with hyposulphite.

For this purpose may also be used enamelled iron plates with holes and furnished with small feet, and made of all sizes.

Blue-stained Negatives for Winter Printing.—Dr. Liesegang points out that, owing to the yellow stain of some negatives, printing through them in winter is often a matter of great difficulty, and he recommends the conversion of the yellow stain into the more actinic one of a blue-violet. This may be effected, he says, by immersing the plate for a few minutes in an old combined toning and fixing bath, as used for aristotype paper.

Elimination of Hypo-soda from Negatives.—As the simplest and surest means for the elimination of the last traces of hyposulphite of soda from negatives and prints, George Hauser (*Littérateur Phot.*, 1893, p. 297) recommends the alkali salts of manganese, especially the permanganate of potassium, being powerful oxidizers, readily reducing the hyposulphite of soda into the harmless sulphite of soda.

Permanganate of potassium, beautiful, reddish-violet crystals, is soluble in 15 to 16 parts of cold water. The solution is beautifully purple. It readily parts with its oxygen, losing its color in so doing, and liberating superoxide of manganese. To test this, add to such a solution, even a very diluted one, a few drops of fixing solution of any desired strength, when all will become clear, losing all color, a plentiful black precipitate being thrown down; the permanganate of potassium is annihilated, because it has parted with its oxygen.

The practical process is as follows: The negative, when fixed, is quickly washed and then placed in a weak (light-violet color) solution of permanganate of potassium. The discoloration of the latter takes place almost immediately; a new bath is applied several times. When no longer discolored, it is proof that all traces of fixing solution are removed from the plate. The negative may then be dried.

It is important to use a very weak solution, as, if used in concentrated form, a long-continued action would attack the gelatine on plate or paper, and by precipitation color it yellow, for the reason that permanganate of potassium oxidizes organic substances also. The yellow color, however, can be removed by an organic acid, such as citric, oxalic acid, etc. This process adapts itself both to negatives (excepting, perhaps, those developed with iron) and paper prints.

DARK-ROOM WORK.

Illumination.—A writer in *l'Amateur Photographe*, under the pseudonym "Ki-Non," protests with vehemence against the continued use of red or ruby glass for the illumination of the dark-room as injurious to the worker. He says:

"For four years, following the lead of Drs. Liesegang and Eder, I have *exclusively* used a petroleum lamp in my dark-room lantern, furnished only with a plate of yellow ground-glass. During that time, whatever brand or plate I have used, and whatever subject I have developed, time or instantaneous, etc., I have not yet fogged a plate. I have even developed orthochromatic plates with this light, taking the additional precaution, however, in such cases, before development, to place a semi-opaque screen between the light and my plate, at a distance of about two feet from the lantern.

"A second and larger lantern, also furnished with a plate of yellow ground-glass, lights the table where the fixing bath is placed. By this arrangement my dark-room is sufficiently illuminated to enable me to read with ease the labels upon my bottles, or even a newspaper if development is protracted."

Red and yellow celluloid is advocated as a substitute for dark-room lamps and windows, and also for the bottoms of developing dishes, instead of the colored glass generally used. The combination of red and yellow celluloid in this connection is said to give a light much more agreeable to the eyes when working in the developing-room, and to be perfectly safe even for the development of highly sensitive orthrochromatic plates.

Mr. W. K. Burton says: "If the following facts be borne in mind, it is possible to work safely in a light that is quite comfortable: 1. No light is absolutely safe, so the developing dish should be covered with a card or something of the kind, except just when it has to be looked at. 2. A plate is more likely to be fogged by light from the back than from the front (it would take too long to give the theoretical reason for this), so when we examine the plate for density, by holding it up against a light, we should do this as quickly as possible, holding it for only a second or two near the lamp. 3. In coming from a bright to the dark room, the light is really enormously brighter than it appears, and care should be used."

DEVELOPMENT AND DEVELOPERS.

Developing Agents.—The multiplicity of developing agents is something extraordinary. As in medicine, where a great number of drugs and medicines are useless, if not injurious, so is it in photography. Each new organic compound having the oxidizing or reducing properties, which sees the day in the chemical laboratories in Germany, is at once introduced in pharmacy or in photographic trade. In medicine we have already too many remedies; and, in photography it is better to confine ourselves to the use of substances with which we are familiar and of which we well know the properties. Each new substance demands a series of new experiments—often lost time. On the other hand, we always entertain the hope of finding something superior to what we already know. Some time ago it was tannin, gallic acid, pyrogallic acid, oxalate of iron, hydroquinone, rodinal, amidol, metol, etc. At present it is *glycin* or oxyphenyl glycin, the result of the action of chloracetic acid on amido-phenol, a brilliant light powder soluble in the alkalies. The bath consists of: Glycin 5, sulphate of soda 15, carbonate of potash 25, and water 90 parts in weight. This colorless solution keeps well. In using, it is diluted with three or four parts of water. The color of the negative is agreeable; it is said, a grayish-black. The action is more prompt than with some of the substances mentioned above; it is possible, however, if we desire to do so, to retard the action by the addition of a little bromide of potassium, or by the greater dilution of the liquid.

Metol, the new developer, promises to be a wonderful helper in the dark-room. It is exceedingly simple in manipulation, has great power to secure detail and any desirable degree of density, is soluble in cold water just like plain pyro, and by its wonderful lasting quality must surely be the most economical of developers. One solution may be used over and over again without loss of developing power. It is especially adapted for all branches of portrait and general studio work, both for time and instantaneous exposures.

The following solution stood in the sunlight in an unstoppered bottle for ten days, and was almost as clear and quite as powerful as when first compounded:

Metol	60 grains.
Sodium Sulphite	360 "
Potassium Carbonate	180 "
Water	8 ounces.

Without the alkali, or with a small proportion of pot. metabisulphite, it seems to keep clear and good indefinitely. The above solution, without carbonate, will develop a plate if time be allowed, but the density may be slight. We have repeatedly started development in this way, and after all detail was out have got up density by gradual or instant addition of alkali.

Amidol is a favorite with many amateur and professional workers. Mr. R. W. Harrison writes regarding it: "Amidol certainly has some very strong points. With a very old developer on your right, a fresh solution on your left, and medium in front, the time of your plate is absolutely under control, and you do not have to wait half an hour to see what is going to happen, for it acts in one-third of the time that the other developers do. It will, moreover, bring a good image, where pyro would only show outlines. One-third the exposure required to produce a good result with normal pyro will show equally good timing in fresh amidol.

"Among its other good qualities are to be mentioned that it keeps well, is readily soluble, does not stain the fingers (constant use retained the old pyro stains on my nails), does not crawl off the half-soaked plate like pyro, does not form bubbles and thereby mark the plate, under ordinary provocations. In short, it is the model developer in all respects except n one thing—it doesn't give as good a printing egative as the cross-grained, bubbling, crawling, antankerous old pyro.

"When I first began to use it, mentally summing p its advantages, I said: 'It does not require the se of an alkali, therefore the film will remain firmer, nd it will not be needed in summer;' but in this atter I forgot for the moment that pyro is an stringent, and of itself hardens the film, which is y no means a firm matter until hardened by the he process of development and fixing."

Development Formulæ.—Two good formulæ for midol development are given as follows:

No. 1.

Amidol	7 grains.
Sodium Sulphite	77 "
Potassium Bromide	3 "
Water	7 ounces.

No. 2.

(*By John Spiller.*) *For the Stock Solution.*

Water	7 ounces.
Sodium Sulphite	1½ "
Amidol	60 grains.

Mix, as required for use, with about three times its ulk of water and a trace of bromide, or none, accord- ng to circumstances. For over-exposure, a weak eveloper and free use of bromide should be resorted o, and for the opposite case, or even for building up xtra intensity in normal exposures, use a stronger olution, with increased proportion of sulphite. The nage should appear in eight or ten seconds, and be lly developed in about four minutes.

Mr. A. R. Dresser's formula stands as follows:

Stock Solution.

Amidol	1 ounce.
Metabisulphite of Potassium	1 "
Water	10 ounces.

For use, take—

Water	20 ounces.
Amidol	16 drachms.
5 per cent sol. of Carb. of Potas.	14 "
10 per cent. sol. of Brom. of Potas.	2½ "

Chloride of aluminium is recommended as an excellent addition to the amidol developing solution when used in tropical countries or during hot weather It hardens the gelatine film and prevents frilling.

Reducin, a New Developer.—This developing agent recently introduced by the Chemische Fabrik au Actien, of Berlin, is of the same class as amidol metol, etc.; is said to be the hydrochloride of diamidoresorcin, acting as an energetic reducing agent on gelatino-bromide films without the addition of an alkali. Commercially it appears as a nearly white mass of loose crystal needles.

Dr. Vogel, of Berlin, gives the subjoined formula

Reducin	3 grammes.
Sodium Sulphite	25 "
Sulphuric Acid	9 drops.
Water	500 c c.

According to Dr. Vogel, reducin is a rapid developer of double the power of pyro-soda developer, *i. e.*, it develops the same image with only one-half the exposure needed for development by pyro-soda. Moreover, by its use negatives are obtainable which re considerably softer and more harmonious than hose developed with pyro-soda.

Development "Tabloids."—Developers in powdered orm, put up in capsules, have long been recognized s a convenience by amateur workers *en tour*. Deelopment "Tabloids" are, however, a further imrovement. They consist of the various developing gents compressed into tabloid form like a lozenge, re easily carried about in the pocket, and are ready or use as soon as dissolved in water. Accelerators re also obtainable in the same form.

At a meeting of German photographers recently, Mr. Schmidt referred to the fact that hyposulphite of oda, which usually acts as an accelerator when used vith the general run of developers, behaves contrarivise as a restrainer when added to the new developer, netol. The solution of hypo used by Mr. Schmidt n his experiments consisted of 1 part of hypo to 100 arts of water. This solution is added, drop by drop, s required, to the developer.

Photographic Development by Electricity.—Combining wo experiments made by Schützenberger in 1869 nd Eder in 1886, Herr Liesegang, of Düsseldorf, as succeeded in developing photographic negatives y electricity. He passes the current from six Gasser dry cells through an almost concentrated solution f bisulphate of soda, containing two electrodes of latinum, separated by a porous vessel. If a photoraphic plate is immersed in the liquid surrounding he negative electrode, the image is developed in a ew minutes with a reddish-brown tint. The liquid emains quite clear. No inconvenience is experienced from the decomposition of the liquid, as the separated elements recombine under the influence of the cur rent. In the fixing bath it loses in intensity, bu preserves its reddish tint.

On the Use of Sulpho-carbamide of Allyl in Photog raphy.—The recent experiments of Col. Waterhouse have shown that it is possible to obtain direct posi tives on glass by the addition of a small quantity o *sulpho-carbamide* of allyl to the ordinary developing bath. This fact becomes important when we know that an exposure of about forty times shorter than usual is sufficient, and that, consequently, this discovery may be applied with advantage to *instantaneous photography.* The sulpho-carbamide of allyl is prepared by mixing the essential oil of mustard with six times its volume of liquid ammonia. The mixture is shaken and allowed to rest for some hours in an emery-stoppered bottle, until the oil has absorbed as much ammonia as possible. The solution is then placed in a flat capsule, in order to allow the disengagement of the ammonia in excess; filter and evaporate to obtain the crystallized product. The crystals are finally purified by re-crystallizations. For photographic use, prepare a saturated aqueous solution of this compound, of which from two to eight drops are added to the developer, according to the quantity of this last required by the plate.

Filtering the Developer.—Mr. A. Helmold, gives a pointer on the advantages following the filtering of old developer worth remembering. He says: "We are in the habit of mixing old developer with the new, and often develop half a dozen plates in succession in the same developer, only adding a little more pyro or soda, as the case may require. We both know very well what a scum forms on old developer, and that wherever any particles of that scum attach themselves to the surface of the plate they prevent action in those places, causing pin-holes and big holes, according to their own size. I say you and I are well aware of this, and yet we—you, no doubt, oftener than I—neglect to filter the developer, and when our negatives are spoiled, lay the blame on the platemaker, who, goodness knows, will never get to heaven anyway. That's all wrong, and you ought to be ashamed of yourself.

INTENSIFICATION AND REDUCTION.

Mr. Chapman Jones gives a good method of intensification with ferrous oxalate and mercuric chloride. He says:

"I believe that any photographer who takes the trouble to master the few difficulties that attend the use of mercuric chloride followed by ferrous oxalate, will be very loath to use any other method for half-tone negatives. The two chief precautions necessary are to eliminate the hypo that remains after washing before treating the negative with mercuric chloride, and to wash away the excess of mercuric chloride before using the ferrous oxalate. The first is done by a few minutes' soaking in an acidified alum solution, and by applying the ferrous oxalate in a dull light, such as is used for manipulating carbon tissue and printing-out papers in. If a little mercuric chloride is left when the ferrous oxalate is added, its onl effect will be to retard the blackening of the image.

The intensification method indicated by Mr. Jone in the last paragraph may be briefly stated as follows The negative to be intensified is first thoroughl washed, and then bleached with mercuric chloride i the ordinary way. It is then thoroughly washe again and flowed over with a ferrous oxalate solutio prepared as follows: Pour one ounce of a saturate solution of ferrous sulphate into five or six ounce of a saturated solution of potassium oxalate acidifie with oxalic acid, and then add three or four ounce of water.

The result of this method of intensification is tha each atom of silver in the original image has by th process got associated with it an atom of mercury and the intensified image is amenable to further intensification, as was the original image.

On another page, by the courtesy of Dr. J. J. Higgins, who has so generously given much useful information to our readers in the past, we present th preparation of a reducer which will be found to possess many wonderful qualities and advantages.

THE PREVENTION OF HALATION

Is a matter which has attracted much attention durin the year. Plates are now obtainable by the use o which this troublesome defect may be entirely obviated. The Seed, Wuestner, Standard, Non-halatio plates are multiple-coated films, based upon the Sandell plate lately introduced in England. Mr. Joh

Carbutt has placed on the market a backed plate which serves the same purpose and gives excellent results in our hands.

A Developer for Non–halation Plates.—

Hydrokinone	30 grains.
Eikonogen	100 “
Rodinal	9 drachms.
Sulphite of Soda	2½ ounces.
Carbonate of Potash	2½ “
Water, make up to	1 pint.

This is a stock concentrated solution. Add in summer 1 part to 7 of water; in winter add 1 to 3 of water, for immediate use. In cases of over-exposure (say fifty times normal), dilute this again with ten times its bulk of water and add 2 or 3 grains of bromide of potassium to the ounce. If this be too slow, add only a very little of the concentrated to eucourage it. It is always far better to use weak solutions than to trust to after-reduction.

A Non-halation Preparation for Plates.—Dissolve 1 part nitrate of silver in 450 parts distilled water, and add aqua ammonium until precipitation ceases; then add 2 parts picric acid and 400 parts alcohol. In this solution the plate is immersed and allowed to thoroughly dry before exposure.

Backing for Dry Plates.--The subjoined solution can be advantageously used for backing plates, and admits of their being placed in the holder without being dried:

Essence of Cloves	6 drachms.
Oil of Turpentine	1 drachm.

Finely powdered Venetian or Indian red is adde to the above to form a stiff paste, which is applied t the plates with a stiff hog's-hair brush.

ORTHOCHROMATIC PHOTOGRAPHY.

As far as present indications go, it will not be man years before orthochromatic or isochromatic plates ar universally used. The subject is well worth th earnest attention of all photographers, whether engaged in studio, outdoor, or reproductive work.

Speaking of his experience with Cramer's Isochromatic Plates, Mr. W. H. Jackson says:

"For a year past I have been using Cramer' Instantaneous Isochromatic Plates exclusively in m work, and, as I have been on the tramp almost constantly all summer, I have had occasion to use ther under every conceivable variation of climate, atmosphere, and altitude—from the excessive clearness o the high Rockies to the October haze of Indian summe along the Atlantic seaboard. In the Yellowstone found that these plates would give softness and delicacy where there was but little aërial perspective, an when the smoky, deadening haze came on, the yellow screen with but a moderately increased exposur would help out in circumstances where it would be a hopeless undertaking with the ordinary dry plate."

In his paper on this subject read before the Photographers' Congress at Chicago, last August, Mr. Cramer summed up the advantages of isochromatic plates as follows:

"The aim of isochromatic or orthochromatic photography is the production of plates equally sensitive to the different rays of the spectrum, so that in the monochrome of the finished picture all the colors are rendered equally correct in their respective values.

"This color-sensitiveness is obtained by the addition of certain ingredients, mostly of the eosine group of aniline dyes, to the sensitive bromide of silver emulsion, and the plates so prepared are called isochromatic or orthochromatic plates.

"A great drawback to the introduction of the isochromatic plates into general use has been the necessity of a color-screen in order to obtain the isochromatic effect. A yellow glass had to be placed before or behind the lens, or a yellow film in place of the diaphragm, to filter the light and to subdue the greater actinic power of the blue and violet rays. The isochromatic effect being increased in the same proportion as a screen of deeper yellow color is used, it necessarily follows that the required exposure is prolonged in the same ratio and to such a degree that the use of a color-screen for portrait work and instantaneous exposure is out of the question. If the yellow screen is not perfectly even in structure and thickness, and absolutely plain, it will cause distortion of the image by aberration. Change of chemical focus and reflection may also be caused by its use, and therefore it is apparent that plates which produce the most isochromatic effect without the aid of a color-screen are the most valuable."

Mr. J. Carbutt, at this Congress, also read an able paper on "Orthochromatic Photography, and Its

Applications." His remarks on the use of color-screens are of value:

"For ordinary landscape work a very bright yellow screen is all that is necessary. A dark yellow, or one of orange shade, would falsify distance. The most suitable place for the color-screen is at the back of the lens-board, sliding it into two grooved cleats, and it should be placed in position when focussing. A screen of such a tint as this one [exhibiting a light-yellow screen] would require an increased exposure of four to six times, depending on the state of the atmosphere—the yellower the light the shorter the exposure. Toward evening it may be dispensed with. The value of a light-yellow screen is best shown where the vista is slightly hazy, or where clouds are included in the view, the forms being much better rendered.

"*Use of Screens in Copying Paintings.*—In this class of work the selection of the proper color-screen is of more importance than in landscape work, and the photographer should be provided with two or three, ranging in tint from a moderately strong yellow to medium and dark orange. Paintings are best photographed in direct sunlight, and by examining the paintings through the color-screen it will not be difficult to determine which one of the screens to select. For instance, take a modern French painting consisting of light and brilliant colors, a yellow screen will answer; but with a German or English painting, containing strong reds and dark blues and green, we would select an orange-color screen, and correspondingly increase the time of exposure. It may astonish some of you to learn that as much as ten minutes' exposure is given in direct sunlight on paintings that are old or painted in strong colors.

"*Developing of Orthochromatic Plates.*—The same developer as used for the plain plate may be used for the color-sensitive plate, except that we find it best to use it slightly diluted, as the color-sensitive plate more readily takes on density. The exposure should always be generous; it is necessary in order to get full color values.

"*Keeping of Orthochromatic Plates.*—A certain amount of doubt as to the keeping qualities of orthochromatic plates has been disseminated in this country. I can only say with regard to those of my own make that I have evidence of many cases where they have yielded perfect results from nine months to a year and more after leaving the factory. Plain plates orthochromatized by the bathing process, writers tell us, are not to be depended on over a few weeks. From past experience I am led to believe that plates from a proper orthochromatic emulsion have as good keeping qualities as the plain plates from the same emulsion."

ORTHOCHROMATIZING GELATINE PLATES.

M. Monpillard, a French worker, prefers to orthochromatize his plates himself, obtaining thereby the maximum amount of color sensitiveness. He invariably uses a colored screen with orthrochromatic plates, and gives formulæ for erythrosine, cyanine, and erythrosine-cyanine baths In the last case the erythrosine solution employed does not contai ammonia, consisting merely of

0.1 per cent. Aqueous Solution of Erythrosine	20 cc.
Distilled Water	80 cc.

This is followed after washing by

0.2 per cent. Alcoholic Solution of Cyanine	4 cc.
Water	100 cc.
Alcohol	5 cc.
Ammonia	1.5 cc.

As a colored screen he employs a trough of glas with parallel sides two millimetres apart, containing one of the following solutions:

For light yellow screen, 1 per cent. solution o neutral potassium chromate.

For deep yellow screen, 5 per cent. solution of neutral potassium chromate.

For orange screen, 8 per cent. solution of potassium bichromate.

For red screen, 0.2 per cent. solution of erythrosine.

Col. Waterhouse says: "For some time past I have been orthochromatizing my gelatine plates by bathing them for one or two minutes with the tincture containing erythrosine silver and ammonium picrate used for the orthochromatic collodio-bromide emulsion process described in the February number of the *Journal of the Photographic Society of India* for last year. The formula is as follows: Erythrosine, 1 part; silver nitrate, 1 part: picric acid, 1 part; ammonia (s.g. 0.880), about 30 parts; spirit of wine, 500 parts; water, 500 parts; 1 part of the above solution being diluted with 9 parts of water to make a solution containing about 1 part of dye in 10,000 of fluid. More ammonia may be added, in the proportion of 1 part to 100 parts of diluted solution. This works exceedingly well for most purposes when orthochromatic plates are required, and for landscape work with the tele-photo lens no yellow screen seems to be necessary, unless there is much blue haze in the distance. The quantity of ammonium picrate may also be increased in such cases."

GROUPS.

Mr. F. W. Bock, in an article in *Wilson's Photographic Magazine*, says: "To combine harmoniously the many different natures which make up a group, without hurting someone's feelings, requires tact. In three minutes one ought to know pretty nearly who wants to sit beside whom. To place persons where they do not want to be nearly always makes them look gloomy. Keep gloom out of your groups by all means. Don't put very dark persons where they will look darker or light ones where they look lighter. Arrange what light subjects you may have where they will look the best and help light up the dark spots most.

"Contrast gives light to a picture. Above all, do not plant your subjects in stiff rows like a pickle exhibit. Give a rather rough-and-tumble arrangement to your group, without going to extremes, which will give it an air of real comfort and ease and harmony.

"It is not always possible to choose the light best suited to group work, but a bright cloudy day is by all odds the best. Between ten and two o'clock the light is strongest, but by increasing the time of exposure I have taken groups as late as five o'clock in December. Sunshiny days are not good, especially where trees are introduced into the composition. The shadows or high lights are very apt to be too strong or blotchy.

"It is hard to get a natural expression to the face unless it be in deep shadow. Sun striking across the face also is apt to cause over contrast in lighting, and squinting of the eyes.

"Photographers in country towns would increase their income, especially during the summer, by making a specialty of outdoor groups. The cost of producing the negative is much less, and the cost of finishing is a great deal less than in portraiture—no retouching or vignetting being necessary. In the long run nothing in our line pays better. The hard-worked operator in the studio needs a change, a rest from the nervous strain of long-continued indoor work; let him take it in making groups out of doors."

STATUARY PHOTOGRAPHS.

In the December (1892) issue of our *Magazine* a photograph of a group representing "The Sisters of Bethany," in imitation of statuary, attracted much attention at home and in Europe. In answer to a request from the *British Journal*, Mr. Motes gave his method of working as follows:

"For background I prefer black velveteen; it is important to have the nap run upward, so that the reflection of light is prevented. Incline the ground from the light, and the result (if not over-exposed) will be almost clear glass. I have three widths in my ground, seams running up, and am never troubled with seams showing if, as stated, the ground is inclined slightly from the light. In order to produce satisfactory results, it is absolutely necessary to use a black ground; and, if by unavoidable circumstances there is reflection on the ground, it can be removed by the method you describe without giving the cut-out appearance, which will invariably be the case if made on an ordinary background, especially around the head. Again, if made on black ground, I have frequently removed all the ground with a knife, cutting around the figure. Frequently parts of the drapery that may be objectionable can be cut away, and made to conform to the taste of the operator. In this case I use a very sharp knife to bevel the edges of the film, to prevent it printing too *sharp*. For the pedestal I use wooden boxes covered with muslin. Coat with glue, and, while wet, sprinkle with sawdust; when set, knock off excess, and paint with color to suit taste to represent granite. I then paint name or title on box, and *shade* so as to represent the letters cut out. In my exposure I work for the shadows with a strong diffused light. Time with great accuracy—too much time will be sure to produce flatness; too little black shadows are very objectionable in this style and lose the effect of marble. I have taken the liberty to be rather lengthy, as there seems to be some misunderstanding as to the methods

I use; so, in the event you have occasion to refer t the matter, you can condense such as suit your purpose."

PHOTOGRAPHY BY ARTIFICIAL LIGHT.

Portraiture by artificial light, such as flashlight electric, or gaslight, does not seem to progress as rapidly as might be. In our city Mr. Rockwood has very successfully adapted the electric light for this purpose. In England gas light is employed in several studios, and in Berlin a photographer uses the flashlight exclusively.

The method of portraiture by gaslight, as employed by Mr. Treble, of London, is thus described in *Photographic Work*. Mr. Treble uses coal-gas as a source of light; he uses seventeen small Welsbach burners, each consuming four feet per hour; these burners being placed behind screens of oiled tissue paper which take the place of the studio windows.

As a means of obtaining a maximum of light by the combustion of coal-gas the Welsbach burner stands pre-eminent; moreover, the light is of a whiter and more actinic character than that of other gas-burners.

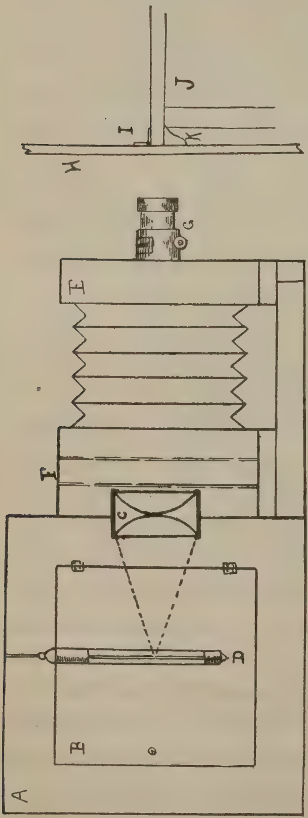
The Welsbach burner in external form and size resembles an ordinary argand gas-burner, and consists of a small Bunsen burner, the flame of which plays upon an earthy skeleton or "mantle" which is cone-shaped, and is held over the flame. The screen of tissue paper (made still more transparent by means of linseed oil) at the side of the sitter is about seven feet long and five feet high, and is supported about eighteen inches from the ground, and twelve of the lamps are arranged about equidistantly behind this screen, a tin reflector being placed behind each. It is essential not to set one lamp immediately over another; otherwise the upper lamp burns imperfectly. A smaller screen, measuring about six feet by two feet six inches, is placed at right angles to the main screen, and at a height of about six feet, this corresponding to a top front light, and behind this screen are five burners.

The background ordinarily used measures seven feet high and six feet wide, and to it is hinged a narrow slip of the same height, and perhaps four feet wide. Opposite to the main light is a reflector or screen about seven feet square, and capable of being hinged or bent in the middle; but this reflector is by no means white, Mr. Treble prefering a neutral gray tint. These accessories are so arranged as to form an alcove for the sitter, or can be thrown open.

Each burner consumes four cubic feet of gas per hour, and gives a light of about seventy-candle power, hence the consumption of gas for the battery of seventeen burners is about sixty-eight feet per hour, and the cost may be roughly estimated at about seven cents per hour. This expense, however, need only be incurred when sitters are in the room, as by means of a by-pass system a small jet can be kept always burning in each chimney, so that by turning on one main cock all the Bunsen burners shall be simultaneously and instantly lighted. The breaking up of the earthy skeletons or mantles is a matter to be mentioned, but they last a long time.

PRACTICAL PROCESSES.

Enlarging by the Electric Light.—Modern photography demands rapidity, cheapness. Sunlight is of the old, and is *not in it.* The electric light is of the new: rapid, cheap, of steady power, always ready. Its use is steadily on the increase for photographic purposes. Its powers, actinically, bring in use one of the oldest developing processes, and it has largely taken the place of platinum printing for enlargements



Recently the writer inspected a plant for enlarging, which claimed every improvement *up to date.* The only thing new that could not be seen was the light itself. All these are identical with such as we used twenty-five years ago.

The cut shows an apparatus used with the oxy-hydrogen and lime light, capable of making enlargements of sixteen diameters in two minutes' exposure.

A. A box with sides 36 inches, bottom 24 inches, made of wood; door at the back for attending to the light.

B. Door in the side, covering a ground-glass, which, on opening, allows the light for fixing, etc.

C. A pair of plano-convex lenses, as condensers, mounted in metal; they should not be less than seven inches in diameter.

D. Electric light. Any ordinary arc light has sufficient power for this purpose, but one that has compensating movements of the carbons is best, as the light will always be at one level. The light should be placed so that a clear circle of light is thrown on the easel. After one adjustment it will require no attention.

E. A camera box reversed on its bed, that is, the ground-glass end is made fast, the front is movable, and assists the adjustment of the objective, G.

F. Slot for sliding in frame for holding the negative; should be adjusted so that the plate comes close to the condensers, and, when closed, perfectly light-tight.

H, I, J, K. A table easel.

J. Table; should be very solid and have large casters on its feet, running in guide strips on the floor.

H. Paper board hinged to edge of table at I, a little above centre of board.

Loose butt hinges should be used; boards of different sizes can then be used on the same hinges.

K. Bracket on edge of table to keep board perpendicular.

Tack the paper in position in the light; throw the board back on table, secure it by hook or button; after silvering, drop it forward and uncap the lens for exposure. The writer used a cap with orange glass in the front; found it a great benefit.

The serum-milk process is the one that has been resurrected for the electric light, and is as good as any. Here are two formulæ; both have been used with equal success.

Skimmed Milk	32 ounces.
Water	32 "

Bring to boiling-point, then add acetic acid No. 8, 1 ounce; filter *hot.* When *cold*, stir in white of egg and again bringing to boiling-point; filter *cold.*

This solution will keep; a large quantity can be sensitized.

Sensitizer.

Serum	1 ounce.
Iodide of Potassium	6 grains.
Bromide of Potassium	4 "

Another formula:

Serum	1 ounce.
Iodide of Cadmium	8 grains.
Bromide of Cadmium	4 "

The paper should be floated on this solution; it can be put on with a swab. The writer of this did so on sizes above 25 and 30 inches. Silvering solution should be 20 grains to the ounce, decidedly acid, with nitric acid c. p., about 3 minims to the ounce.

Developer

Pyro	96 grains.
Water	64 ounces.
Acetic Acid, No. 8	6 "

The acid may be varied in quantity, according to the tone required. Fix in hypo.

A Rapid Dry Collodion Process.—For some years past we have referred in MOSAICS to a dry collodion plate about to be put upon the market. This plate is now obtainable in England, but, as far as our information goes, has not been received as yet with the expected favor. For many purposes such a plate is desirable. Having experimented with Dr. Hill Norris's process, which was patented some four years ago, without obtaining satisfactory results, M. P. David, of the Service d'Identification de la Préfecture de Police, Paris, has introduced some modifications of his own, and gives the following method of preparing a dry collodion plate of a sensitiveness about 22° or 23° Warnerke. He coats a plate, 180 x 240 cm., with 25 c.c. of collodion, containing 18 grammes of silver nitrate and 7 to 8 grains of pyroxylin per litre. The film being set, the nitrate is bromized in a bath of

Potassium Bromide	80 to 120 grammes.
Potassium Iodide	0.01 "
Gelatine	2 "
Distilled Water	1000 c.c.

Sensitiveness is obtained by immersing the plate for a greater or less time in a solution of

Potassium Bromide	18 to 25 grammes.
Gelatine	1 gramme.
Distilled Water	1000 c.c.

The sensitiveness increases with the temperature of the bath. At 70–75° the plate is left for about two hours; at 90–95°, for one hour. The figures are, however, approximate. The plate is then washed and dried. Contrary to what might have been supposed, says M. David, the collodion film does not show any tendency to leave the support even at a temperature of 100° C., provided that the surface of the glass has been carefully prepared.

In the September issue of *Wilson's Photographic Magazine* Mr. Jex Bardwell gave in detail the old "Coffee Dry Collodion Process," to which those who desire to follow the subject further are referred.

Watch-dial Portraits.—Photography may be very effectively employed in the decoration of watch-dials for presentation purposes, and portraits executed in this manner are always attractive, and add considerably to the photographer's exchequer and reputation. These transfers may be made in various ways, some prefering one and some another. One popular method is to sensitize with a collodion chloride emulsion a previously talc'd glass. When thoroughly dry print the reduced portrait thereon, using a suitable oval or other shaped mask, tone and fix in the usual way, and dry over a spirit lamp or spontaneously. The film is then softened with methylated spirit, and soaked in water acidified with a few drops to the ounce of acetic acid.

In this bath the film may be easily floated off, if gently manipulated with a camel-hair brush. A sheet of paper is then passed beneath the film (while under water), and lifted out in contact. At this stage it is easy to cut out the portrait along the lines of the mask with a pair of small, sharp scissors.

Next, pass the portrait on its temporary support into a dish of plain water, where they will again separate. Take the watch-dial (previously albumenized) and pass it beneath the film in the water, and gently entice it into position by means of a camel-hair brush, being careful to avoid air bubbles. Raise from the water bath and allow to dry spontaneously. A coat of clear hard varnish over the whole dial completes the operation. Other methods will suggest themselves, including the much-neglected, though beautiful, carbon process, and the very simple transferrotype of the Eastman Company. The latter films may be purchased in any size at a low price, and full directions for working accompany each dozen.

Clement J. Leaper's formula for collodio-chloride for printing out is most suitable for the purpose, and is as follows:

a. Alcohol, 1 oz.; Ether, 1 oz.; Pyroxylin, 12 grs.
b. Silver Nitrate, 60 grs.; Water, 1 dr.
c. Strontium Chloride, 64 grs.; Alcohol, 2 oz.
d. Citric Acid, 64 grs.; Alcohol, 2 oz.

Mix 30 minims *b* with the whole of *a*, add a drachm of *c* and half a drachm of *d*. Shake well after each addition, and coat at once.

If the collodion film be toned with platinum instead of gold, it may, when transferred, be *burnt in* by any one using a muffled furnace. This gives an absolutely imperishable portrait within the body of the enamel. —W. Ethelbert Henry.

Photographing on Marble.—A very pretty effect is gained by printing a photograph on marble, which can be done in the following way: An unpolished plate of marble must be coated with a solution o benzine, 500 parts; spirits of turpentine, 500 parts asphaltum, 50 parts; and pure wax, 5 parts. Wher this is dry the plate is exposed under a negative which will take, in sunshine, about twenty minutes. Develop with spirits of turpentine or benzine and wash in plenty of water. The next step is to cover the plate where it is intended to be left white with an alcoholic solution of shellac, and immerse the same in any dye which is soluble in water. After awhile, when enough of the coloring matter has entered the pores of the marble, it is taken out and polished.

To Obtain Prints Direct from Medals or Coins upon Fabrics.—Immerse linen, cotton, or preferably silk, in a fairly strong solution of nitrate of silver, and when almost dry stretch, in close contact, over the surface of a coin or medal. In a little while the design appears upon the fabric. Simple washing with water removes the undecomposed silver from the fabric, and the design remains stained therein.

To Obtain Prints Similar to Crayon Drawings.—Coat ordinary Steinbach or drawing paper with the following solution:

Gelatine	20 parts.
Chlorhydrate of Ammonium	10 "
Water	1000 "

To which 200 parts negative varnish are added, drop by drop, stirring constantly. This mixture forms an emulsion. When dry, sensitize the paper in a bath composed of 200 parts nitrate of silver to 1000 parts of water. Print in the usual manner and tone in

Double Chloride of Potassium and Platinum .	2 parts.
Citric Acid	4 "
Water	1000 "

For the fixing solution use 1 part hyposulphite of soda to 5 parts of water, after which wash the prints horoughly in several changes of water.

Blackening Brass.—Here are some details of the blackening of metal diaphragms, given by H. H. Buckwalter in the *Pacific Coast Photographer.* He dissolves an ounce of copper nitrate in three or four ounces of water. The diaphragms are then heated n the flame of a spirit lamp and dipped in the copper solution. Without drying, they are again heated in the alcoholic flame until the metal sets a red color, which instantly changes to black on withdrawal from the flame. It is sometimes necessary to repeat the dipping. When cool, clean the metal with a damp cloth.

PRINTING METHODS.

Printing methods multiply as photography develops. The search after permanency has induced more effort in the direction of carbon and platinotype, and both of these are gaining ground. Albumen has received a stunning blow from the "Aristo" crowd, but it has not lost all of its backers by any means.

Mr. D. Bachrach, Jr., says: "I *do* know this: that a print made upon unsized, strongly salted and strongly silvered plain paper, thoroughly toned with gold or platinum and fixed in fresh hypo of good strength, and washed moderately but thoroughly, may be fairly pronounced 'permanent,' almost as much so as a 'platinotype,' and the latter is abs lutely so. It may be taken for granted that a pri made with a foundation of a strong body of chlori silver, taking up a good quantity of gold in tonin will stand destructive tests better than where t reverse is the case, and proportionately better whe no organic medium is employed. Next to this com the old, much-abused albumen process, where a sing coat of *pure* albumen was used with strong saltin and again, where these prints were made by goo establishments, using fresh hypo solution daily, fe of them will be found to have faded."

Photographic Printing with Cerium Salts.—Messr A. & L. Lumière have communicated to the Par Academy of Sciences the results of their investig tions with cerium salts for use in photographic prin ing. They state that the cerous salts are stable, bu the ceric salts are easily reduced, and they obtaine the best photographic results with the ceric sulphat and nitrate. Water solutions of these salts were use for sensitizing paper, and under the influence of ligh the ceric salts were reduced, and a change of colo was produced in the paper, the image being develope or brought out by treating the paper with a carbo compound of the aromatic series, which will form a insoluble coloring matter with the unreduced ceri salt. The note is worth the attention of photographic investigators, though probably the result attainable may not be better than those so wel known.

To Give the Effect of Age to Platinotypes.—Sometimes in making copies of old art prints by the new d-bath platinotype process, the appearance of age the copy will give it a closer resemblance to the ginal. An English amateur has secured this ect by toning such prints in a strong infusion of ck tea.

A new method for the preparation of platinum per was lately given in the *Rundschau* by M. tzeck. The particulars are as follows:

Ordinary paper, glazed paper, or Rives paper is ed with arrow-root jelly, prepared as follows:

Arrow-root	1 gramme.
Cold saturated solution of Oxalate of Soda	50 c.c.

oil until the fecula is dissolved.

Give two or three layers of this size, according to porousness of the paper used; paper thus pre- ed and dried can be preserved without fear of erioration. Sensitize by means of the following uid to obtain *the black tones.* Mix the following d solutions:

Chloro-platinate of Potassium	5 c.c.
Double Oxalate of Soda and Iron	8 c.c.
Chlorate of Potash	3 drops.

For sepia tones mix the following cold saturated ution:

Chloro-platinate of Potassium	5 c.c.
Double Oxalate of Soda and Iron	4 c.c.
Neutral Oxalate of Soda	3 c.c.
Bichloride of Mercury	1 c.c.
Chlorate of Potassium	3 drops.

A greater quantity of chlorate of potassium in- eases the contrasts; a smaller quantity of the mercury solutions tends to produce black tones. must bear in mind that the solution of oxalate of and soda is sensitive to light and should not be posed to it. The quantity of liquid resulting one or the other mixture is sufficient to prepa whole sheet of 40 x 56 centimetres. If the prep tion of the paper is carefully made and the p rapidly dried at a temperature of 95° F., we obtain fine tones and strong images.

Converting Blue Prints into Black Prints.—The *R de Chimie Industrielle* says that the prints shoul first passed through water acidulated with nitric a and thence into

Carbonate of Soda	50 grammes.
Water	1 litre.

In this the picture is changed to an orange t when it is removed and placed in

Gallic Acid	50 grammes.
Water	1 litre.

being subsequently washed in water acidulated w HCl.

The French Society of Photo-Chemistry has p sented a paper prepared with a salt of iron, which developed simply by submitting the exposed pa to steam. This process is due to M. Boivry, wh results obtained until now, however, leave somethi to be desired, because the picture is found to be su too much into the paper; nevertheless, this ve economical paper may prove to be serviceable. Gr care is necessary in exposing it to light; but one

ided by the progress of the picture, which is faintly
ible in the printing frame.

Restoring Faded Prints.—Dealing with this problem,
. Janeway, of New York, writes: "Remove the
nt from the mount, soak in water, and immerse in a
ution of neutral chloride of gold and potassium (3
4 grains of gold to 4 ounces of water) till the de-
ed tone is obtained. Wash in subdued light; clear
d wash carefully again. H. Sandaurek received a
edal from the Photographic Society of Vienna for
e process of restoring albumen prints that have
led. His baths are: No. 1. Tungstate of soda, 100
ammes, or 3½ ounces; distilled water, 5000 cubic
ntimetres, or 175 ounces. No. 2. Carbonate of
ne (C.P.) 4 grammes, or 62 grains; chloride of
ne, 1 gramme, or 15½ grains; chloride of gold
d sodium, 4 grammes, or 62 grains; distilled water,
0 cubic centimetres, or 12 ounces. Solution 2 is
ade in a yellow glass bottle, well stoppered, and
owed to stand for twenty-four hours before use.
is then filtered into another bottle of yellow glass,
d, to preserve it, well corked. To use, say for a
eet of albumen paper, take 150 cubic centimetres,
5½ ounces of No. 1, to 4 to 8 cubic centimetres,
1 to 2 drachms, of No. 2. These prints, well
ashed, are placed one at a time in this bath. The
rengthening must not be too rapid, ten minutes
eing sufficient in summer, and the bath must not
ntain an excess of chloride of gold. Properly used,
beautiful, clear purple color is obtained. To clear
e prints, take 150 cubic centimetres, or 5¼ ounces
solution No. 1, to 15 cubic centimetres, or 4

drachms, of hyposulphite of soda. The strengthe prints are well washed, placed in this bath one a time and soaked until the yellow color is enti gone, which requires, in some cases, three to hours, when they are again thoroughly washed.

Printing-out Papers of a great many "brands" now offered to photographers, each one with clai of superiority which can be readily put to the test account of ease of manipulation. This very ea however, causes much carelessness and consequ failure, so that any hints, helpful to success, will welcome. The following has been collated from year's literature. Mr. John A. Tennant, a go authority, in *Wilson's Photographic Magazine*, sa concerning "Blue Label Aristo" paper:

"While my prints were being printed I prepar my toning and fixing baths. The toning bath w simply made up as follows: The contents of a bot of 'Aristo' gold (No. 2, four drachms) were put in a four-ounce bottle, which was then filled up wi water. This was for the stock solution. Tv drachms of this stock solution were used for a ba of forty ounces in volume. To this bath a sufficie quantity of a saturated solution of borax was add to make the bath very slightly alkaline. After hour had passed the bath was ready for use. F fixing I used a bath containing one ounce saturat solution of hypo to over ten ounces of water, which the prints were fixed by being immersed f twenty minutes.

"When the desired batch of prints was finishe printing I washed out a large, shallow tray with h

ater, and then placed the prints, one by one, face
wn, in a little warm water (about 110° F.) in this
ath, using just sufficient water to saturate the whole
atch. When all had been flattened down I kept
em so for about five minutes or more to completely
viate any tendency to curl.

“Four washings in plenty of warm water to elimin-
e the free silver completed my preparation for ton-
g. The prints were then placed in a tray of cold
ater for a few minutes to harden the size in the
aper. Placing the prints, one by one, in the ton-
g bath, I was charmed with their behavior; they
hanged color slowly, but the image seemed to build
self up in solid color, the shadows gradually became
ore and more richly transparent, and the lights
leared beautifully. Not knowing whether the prints
ould change color in fixing, I allowed for slight
hange by toning until the slightest trace of purple
as discernible, and as each print reached that stage,
mmersed it in a bath of water acidulated by a few
rops of acetic acid.

“This completed, I placed all in the fixing bath, as
efore described, and gently rocked the bath for
wenty minutes, afterward washing with frequent
hanges of water for an hour and a half, obtaining
r my trouble prints possessing more brilliancy and
finer gradation of tone than I have as yet secured
y any other printing process known to me.”

Manipulation of Gelatino-chloride Paper.—Mr. Mid-
inter, of Bristol, a professional photographer with a
arge practice, gives the following account of his
anipulation of gelatino-chloride paper after toning

and fixing: The final washing being completed, t
prints, as taken from the water, are made up int
close pile, all the faces being downward, and a sl
of plate glass is convenient as a base upon which
lay the pile. The surplus water is now dried off t
top of the pile by means of a cloth, and the back
the top print is brushed over with a mountant (star
paste). The top print is now taken from the pile, la
on the mount, and contact is established by rubbi
down in the usual way, a slightly damp and s
sponge being convenient for this purpose. The prin
will now very soon be ready for spotting, and f
simple cold rolling, if that course is decided upo
Mr. Midwinter, however, rolls with hot rollers, a
to obtain the best results by this hard rolling t
prints should not be too dry, but, at the same tim
not damp in any ordinary sense of the word. M
Midwinter stores them for the night in a box havin
a perforated bottom, and beneath this is a draw
containing some damp sponges, and in the mornin
they are found to be in the right condition to take
high gloss from a hot roller, under which they a
passed a few times, but no lubricant is used. Th
hard, enamel-like face obtained in this way is likel
to be pleasing to most people.

To Prevent Aristo Paper "Sticking."—A correspon
dent in Anthony's *Photographic Pointer* suggests th
aristo paper should be dusted over with powdere
soapstone (lightly rubbed off with a piece of flanne
before being placed in the printing frame. By th
method all danger of the print adhering to the neg
tive is avoided.

Toning Aristo Prints.—At a recent meeting of the *Société d'Études Photographiques*, M. Maurice gave a description of his method of toning aristotype papers. In the opinion of this old and skilful worker, the best toning bath is still the one containing chalk and made according to the following formula:

Warm Water	1000 parts.
Pulverized Chalk	8 "
Solution of Chloride of Gold at 10 per cent. .	60 "

The prints, after being washed, are placed in this bath until they reach the desired tone, which is judged by transparence. They are then fixed in the subjoined bath:

Warm Water	1000 parts.
Hyposulphite of Soda	200 "
Alum	20 "
Acetate of Lead	1 part.

Although good results have been obtained with certain combined toning-fixing baths, M. Maurice recommended that these operations should be made separately in order to avoid sulphuration. Baths containing sulpho-cyanide of ammonium should be avoided.

In treating gelatino-chloride prints, the addition of alum to the first wash-water will be found advantageous, as also in the fixing bath, to harden the gelatine coating. American workers will, however, find one of the hardening solutions, readily obtainable, conducive to better results than ordinary alum.

Liesegang's Combined Toning Bath.—Dissolve:

Water	24 ounces.
Hyposulphite of Soda	6 "
Sulpho-cyanide of Ammonium	1 ounce.
Acetate of Soda	1½ ounces.
Sat. solution of Alum	10 "

Fill the bottle containing this solution with scrap of sensitized paper and leave it for a day. Then filte and add the following solution:

Water	6 ounces.
Chloride of Gold	15 grains.
Chloride of Aluminium	30 "

Lithium Toning Bath for Gelatino-chloride Prints.— The subjoined bath is said to give delicate half-tone and rich shadows when used with gelatino-chlorid printing paper:

Carbonate of Lithium	1 drachm.
Water	8 ounces.
Chloride of Gold	2 grains.

The free silver must be eliminated from the print by washing before toning, and the toning bath use as soon after preparation as possible.

Platinum Toning for Solio Paper.—First, tone ver slightly indeed to a light brown, in the following (th prints having been previously washed, as usual):

Potassium Chloro-platinite	5 grains.
Sodium Chloride	40 "
Citric Acid	40 "
Water	20 ounces.

and immediately transfer directly to the combine toning and fixing bath indicated on the next page:

Stock Solution No. 1.

Hypo	6 ounces.
Potash Alum	1½ "
Sodium Sulphate (Glauber's Salts)	4 "
Water made up to	60 "

First dissolve the hypo and alum in the water, then add the sodium sulphate.

Stock Solution No. 2.

Gold Chloride	15 grains.
Acetate of Lead (Sugar of Lead)	50 "
Water	7½ ounces.

NOTE.—An orange precipitate is formed in No. 2 olution, which, however, redissolves on its being added to the No. 1 solution.

To form a combined bath, take of:

Stock Solution No. 1	8 ounces.
Stock Solution No. 2	1 ounce.

Do not use until the mixture has become quite clear. This produces tones of a rich, warm black; but if purple tones are desired, tone first with sulphocyanide, and then follow with the combined bath.

A Reliable Toning and Fixing Bath.—Herr E. Valenta, in *Photo Correspondenz*, referring to the combined toning and fixing baths says that their popularity is undoubtedly due to their simplicity and he satisfactory results obtainable by their use. After much experimenting he recommends a solution for his purpose composed as follows:

Dissolve in 1000 parts of Water (distilled)—

Nitrate of Lead	10 parts.
Hyposulphite of Soda	200 "

Before use add 50 parts of Chloride of Gold (1 : 1000.)

This bath, which is suitable for most of the aristo type papers, may be used at soon as made up, bu gives the finest results only after a few prints hav been toned in it.

For the purpose of hardening the gelatine films o negatives or gelatine-chloride prints developed o toned with amidol, Dr. Stolze recommends the addition of a few drops of a saturated solution of chlorid of aluminium. When the addition of this chlorid causes the bath to become milky in appearance th solution should be prepared previously, allowed t stand for some hours, and the precipitate throw down and separated by decantation.

For Strengthening Aristotypes.—According to Dr Liesegang, aristotypes which have been too lightl printed may be strengthened before or after tonin (care being taken that no hypo remains in the prints by placing them in an aqueous solution of hydroquinone, citric acid, and nitrate of silver. The proportions of these chemicals are unimportant if th solution is but sufficiently acid to prevent reactio between the hydroquinone and the silver. A fe drops of ammonia should be added to the bath befor use, according to the degree of strength desired i the prints.

A Developer for Aristotypes.–In the *Photo. Rundschau* W. Cronberg recommends the following for th development of faintly printed aristotype prints.

Pyrogallic Acid	3	parts.
Citric Acid	5	"
Distilled Water	350	"

Of this solution 20 parts are diluted with 200 parts of water, into which bath the prints are placed without previous washing. When the prints have attained almost the full strength desired (they will gain a little in vigor after having been placed in the wash-water), they are rinsed several times and toned and fixed in a combined bath. By this method more prints may be secured from a negative in a given time than by the usual method, and except the development the treatment is as usual for print-out papers.

To Reduce Over-printed Aristotypes.—An old hypo bath, to which a few drops of a saturated solution of ferrocyanide of ammonia have been added, is said to be an excellent reducer for over-printed aristo prints and also for prints on gelatino-bromide paper. In the *British Journal Almanac* for 1893 (p. 643), another formula to secure the same result is given. This reducer is composed of hypo and ferrocyanide of potassium. A writer in *Photo. Nachrichten* says that the reducer given above may be greatly improved by the substitution of rhodanammonium for the hypo. Rhodanammonium being much more readily washed out of the prints than hypo, much time and trouble may be saved by its substitution. The working formula is as follows:

Ferrocyanide of Potassium	5 parts.
Rhodanammonium (or Sulpho-cyanide of Ammonium	10 "
Water (distilled)	500 "

If the reduction desired is small, a smaller proportion of ferrocyanide of potassium should be used than is here given. After treatment in this bath brief washing of the prints is sufficient.

Toning with an iridium bath is recommended now and then:

Double Chloride of Iridium and Potassium	1.5	parts.
Neutral Tartrate of Sodium	15	"
Water	100	"

Boil for two minutes, then add—

Water	400	parts.
Acetic Acid	10	"

The toning processes in which bismuth, mercury, and other metals are used are less important, and after these have been considered the remainder of the paper is devoted to a careful study of the various fixing methods.

Gelatine Printing-out Papers and Platinum Toning.—*Photographic Scraps* says: "We have frequently expressed an opinion that P. O. P. prints toned by this method were not satisfactory in result. There was an absence of purity in the whites, and a general degradation over the whole print that we did not admire, and which seemed to us to indicate a general stain rather than a deposit of platinum on or in substitution for the silver. We tested prints made by every formula which has been given for platinum toning, and found *that absolutely no platinum was deposited on the image.*"

An acetate of lime toning bath, being less prone than the soda bath to deposit the gold as a purple precipitate, is recommended by M. Hermite. The ollowing two stock solutions are made up and mixed welve hours before they are required:

A.—Water	500 cubic centimetres.
Chloride of Gold	1 gramme.
B.—Water	1500 cubic centimetres
Acetate of Lime	28 grammes.

One volume of A is mixed with three volumes of B.

Collodion Emulsion.—A collodio-chloride emulsion which may be poured on by one single coating is described as follows by Herr E. Hirsch, in the *Deutsche Photographen-Zeitung*:

Solution A: *a.* 14 grammes of silver nitrate are finely powdered in a mortar, together with 10 drops of distilled water; *b.* 840 c.c. of 3 per cent. collodion are added to *a.* by constant rubbing.

Solution B: Lithium chloride 2 grammes; citric acid solution, 2 grammes, dissolved in 125 c.c. of alcohol.

Also, this solution is added to solution A by constant rubbing. Finally, 15 drops of glycerine and 15 drops of castor oil are added; the whole is violently shaken and filtered through cotton-wool. The following should be borne in mind: The vessels and solutions should be hand-warm; the silver nitrate, and also the silver nitrate together with the collodion, should be well rubbed down. It will be well to rub down the collodion in smaller quantities with the pulpy silver nitrate, to allow to settle, to decant the clear liquid, then to add again fresh collodion, to rub down, to allow to settle, to decant, and so on, until the whole of the silver nitrate is incorporated with the collodion. The process may be carried on by lamp-light, and the emulsion is poured on its suppor (glass or paper), in the well-known manner, in warm and well-ventilated room which is free fron dust. The emulsion should not be kept for a lon time.—H. GUNTHER, in the *News*.

Prints by Development on Aristotype Paper.—Dr Liesegang recommends to make a weak print an then to plunge it, without previous washing, in

Gallic Acid	5 grammes.
Acetate of Soda	5 "
Tannic Acid	3 "
Water	350 c.c.

It will develop entirely of a warm black. In a solution of hyposulphite of soda it will turn green, whilst in a mixed toning-fixing bath, say Columbian "No-Gold," it will acquire a warm tone. This bath may be used several times if care be taken to separate the precipitated silver by filtering.

The Treatment of Gelatino-Chloride Paper.—A writer in the *British Journal* suggests the use of sulphate of magnesia, added to the washing water instead of alum, for the purpose of preventing softening or "frilling" of the film.

It is also extremely advisable, according to the same writer, and, we may add, to the experience of old workers in this printing process, to use distilled water for the *first* washing in removing the free silver in the film before toning.

After the bulk of the free silver has been removed it is recommended to wash the prints in a plain solution of chloride of sodium. These two details will greatly assist the operator in securing even tones without mealiness or patches of uneven tints.

Finally, after the prints are fixed and the soluble salts have been removed by careful washing, an alum bath may be used, and will be found to render the prints as easy to manage in mounting and finishing as the familiar albumen prints.

To Trim Prints When Wet.—Place a piece of manilla paper on a *smooth board.* Lay the wet print on this paper. Place the glass guide in position and trim with a sharp knife, same as if the print were dry. If the knife is *sharp*, there is no possible danger of tearing the edges of the print. I got this hint from Mr. Cook Ely, of Oshkosh, Wis., and as it is the only plan I ever saw for trimming wet prints with *safety*, I thought it might save some brother photographer's time and wrath to tell you.

To Transfer Albumen (*and Aristo ?*) *Prints upon Wood, Metal, or Porcelain.*—According to the *Amateur Photographe*, of Düsseldorf, this may be accomplished as follows: The material on which the prints are to be transferred is cleaned thoroughly and polished, then coated with thick copal varnish. Upon this surface, before it is quite dry, the albumen print (or aristo ?) should be squeegeed while damp. It will dry in about four hours, when the paper may be rubbed off by careful treatment with a damp sponge, the image forming the picture adhering to the varnish.

"*Kalona*," a collodio-chloride paper made by the New York Aristotype Company, says Mr. John A. Tennant, "prints rapidly, does not curl unduly if properly handled, behaves well under intelligent manipulation; tones with the simple formula sent with it (No. 1), a little slowly, but presenting rich tones of great depth and delicacy, and after fixing and washing, my prints were all that I could desire."

This experience, it should be noted, is precisely similar to my experience with most of the American papers. I have not found that Kalona possesses any decided quality or advantage over its competitors, except that, perhaps because of the simple toning bath, a little slower than those generally recommended, I thought the tones richer and the shadows a little more transparent than with some papers. That, however, may have resulted from the negatives employed.

As received from the makers, Kalona paper is of a purple-pink tint. It should be printed quite two shades darker than is desired in the finished print, and, while printing, requires constant attention, since with thin negatives it prints very quickly. As with other collodion papers, it is imperative that the fingers should not touch the face of the paper, or red spots will eventually result, which utterly ruin the appearance of the print.

Before toning, the prints should (singly) be placed, face down, in shallow water to prevent tendency to curl. It is better to dip them in warm water, and then quickly place them upon an inclined tray, gently patting them (on the back) with the hand until they are quite limp. When so treated they may be washed in cooler waters successively until all free silver is eliminated. The final water should be quite cold, or qual to the temperature of the toning bath used. everal toning baths are recommended.

The combined toning bath is in great favor with nany users of printing-out papers of all classes. he Eastman Co. offer prints made upon "Solio" aper which had been prepared eleven months before se, as proof that paper will "keep," and for it the ombined bath is recommended as the best. The arious methods are given and a choice is easily deermined upon.

Mr. Schmidt, in *Photographen-Zeitung*, gives as his pinion that the yellow color of the high lights of rints toned in a combined toning-fixing bath are imply the result of weakness of the fixing agent dded to the bath, which loses its power before the ower of the toning agent is employed. He recomnends, therefore, the frequent addition of hyposulhite to such baths, or preferably, that the toned acidixed prints should be treated in a second and weaker ath to insure permanency and clearness of the vhites of the pictures.

"*Ilotype*" proper presents the same advantages vhich have given it favor. Mr. J. A. Tennant says f it:

"In manipulation its peculiar characteristics are at nce apparent. In the first place it has no tendency o curl whatever. It is placed direct from the printng frame into the combined toning and fixing bath vithout previous washing, and at once assumes a limp, ut not too soft condition. It can be toned slowly or uickly as desired without prejudice to the lights; as oon as it presents the desired tone, it may be washed in the usual changes of water, and mounted withou further delay. The toning and fixing occupies, as rule, about five minutes, and by giving the prints thirt minutes' washing, a batch can be printed, tone washed, mounted, and burnished in one hour, wit perfect results."

The simplicity of this manipulation will be eviden to all who have had experience with aristotype paper Contrasted with the manipulation of albumen pape or even gelatino-chloride paper, the use of Ilo pape reduces the labor of the photographer more than one half. Any desired tone or finish can be obtained b simple modifications which do not consume additiona time or labor.

The toning and fixing bath may be obtained i concentrated form with the paper, and simply needs th addition of nine ounces of boiling water to the "smal bottle," which supplies solution sufficient for 25 cabinets. The preparation of this bath is not secret

Preservation and Printing of Celloidine Papers.—The cut and entire sheets should be kept as far as possible in a dry and cool place. For this purpose boxes may be used containing chloride of calcium, which keeps the paper perfectly dry. By placing these well-closed boxes in the cellar we obtain two desired conditions —dryness and coolness. Any trace of the fingers on the sensitive film would, later, infallibly show itsel by a spot. The paper, therefore, should be handled with great care. Printing in general is very rapid, but some papers lose more than others in the toning, and should be exposed for a longer time. When the prints are made, if they are not immediately toned, hey should be again placed as far as possible in a dry and cool place.

Toning, Fixing, and Washing.—The temperature of the bath should be between 15° and 18° C.; this condition is absolutely necessary and offers no difficulty. By placing the toning dish in a larger dish containing water and ice, the desired temperature can be quickly obtained. Each print should be manipulated with tongs made of horn or celluloid, and not with the fingers. The toning-fixing should be rapidly done. The print should not remain longer than five minutes in the bath, which, consequently, should always be partially renewed and never left poor in hyposulphite of soda. The washing of the print should also be done in cold running water.

The "B. P." "Red label" paper is worked as follows:

Print same as albumen paper.

Paper, negatives, and printing pads must be perfectly dry.

Separate Toning and Fixing Bath.—*Washing:* Wash in several changes of cold water until all trace of free silver is removed. The last wash-water, before prints are placed in the toning bath, *must* be perfectly clear. Keep prints face down during all operations, and B. P. paper will float like albumen.

Trays: Do not use agate or iron trays: Papier-mache are the best.

Toning bath: Any good albumen bath, neutral or slightly alkaline can be used.

Temperature: The bath must be cool, and tone not faster than from six to eight minutes. Prints must be kept in motion to obtain even tones. Tone fa down, and rock your toning dish.

Tone not quite as far as desired in the finished print

The following gold bath, with little care and jud ment, gives most beautiful results and any tone. Th bath can be used immediately after mixing, but better if allowed to ripen for two or three hours.

If bath is too alkaline, add citric acid, and if to acid, add borax. Which one is required is show by the test with litmus paper.

When cold tones are desired, use a strong bath a given below; when warmer tones are desired dilut bath with water.

Gold Bath.

Water	64 ounces.
Saturated Solution of Borax	½ ounce.
Saturated Solution of Acetate of Soda . .	1 drachm.

Add gold in solution slowly; sufficient to tone (grain of gold will tone 20 to 30 cabinet prints) Now test with litmus paper, and add citric acid (saturated solution) drop by drop to *almost neutralize th bath, keeping same slightly alkaline.* The borax an acetate of soda in above bath may be substitute with one drachm of saturated solution of phosphat of soda.

Where water is very alkaline add a few drops o citric acid solution to last water before toning. This prevents the gold bath from getting too alkaline. Where waters are bad, distilled or ice water should be used for the gold bath.

The "Kirkland lithotype" is one of the most promising of the newer papers. A fine print upon t was presented with *Wilson's Photographic Magazine* or October, 1893. Those who wish to "approach lbumen tones" are easily enabled to do so with this aper. The method of working may be found as bove. It is simple, sure and easy to work.

Mounting "Aristo" Prints.—Mr. W. B. Bolton in the *British Journal* helps us to the following:

"Instead of mounting the prints direct from the last washing water, blot them off and lay them out to dry in a warm room, which will not take very long at this time of year, and they may be finished off at the fire. If they are properly alumed there is not the least danger of their sticking to the blotting-paper or of "fluff" adhering to them. Then, before mounting soak them in water again to soften and swell them, and proceed.

"The drying before mounting is, of course, a necessity if the prints are not trimmed to size before toning, and even in the case of cut sheets the operation of trimming has to be performed at some stage. It puzzles me to know why the manufacturers send out cut sheets the exact size of the negative instead of a quarter of an inch smaller each way. The margin has to be trimmed off in any case, unless the finished prints are to be improved by being mounted with a black margin representing the rebut of the dark slide. There is, however, one advantage, namely, that the edges of the print are cleaner after trimming before mounting than would be the case if cut sheets the exact size of the final prints were used, for then the handling in the course of manipulation is liable to loosen the gelatine and cause ragged edges.

"As to the style of mounting, let those who lik the 'bonbon-box glaze' continue to use plate glas and allow the mounted prints to dry before strippin But, for ordinary purposes, ebonite or ferrotype plat will be found better. The latter, indeed, if of the be quality, have a surface little inferior to glass. Som of the papers on the market now, however, requir no squeegeeing on to glass or anything else, but dr with a surface equal to superior albumen prints whe mounted in the same manner, though they are improve by burnishing, which is an operation beyond the reac of most amateurs.

"Celluloid, however, is my favorite where a squeeg support is used, and either sort of surface—matt o polished—can be got, according to the side of th celluloid used, the prints stripping as easily from th smoothed or grained side as from the polished. Th transparency of the celluloid is also an advantage especially when the plan of mounting to be describe is adopted, and it is one I have found very convenient.

"I have sheets of celluloid cut to the exact size o the prints when ready for mounting, and the dampe prints are squeegeed on to these. The celluloi sheets may, in fact, be utilized as trimming shapes, the untrimmed print being squeegeed in contact, and then cut to the exact size with a pair of *sharp* scissors; in fact, this is the more convenient plan. This having been done, the back of the print is starched or gelatined, and together with the celluloid is placed on the mount and left to dry. There is no danger of the prints sticking together if placed in a film under ressure; indeed, they are all the better for such reatment. When quite dry, the celluloid comes away asily, and is ready for another batch of prints after olishing with talc or wax.

If I might make a suggestion to the dealers in hotographic goods, it is that they should send out ut sheets of celluloid prepared for this purpose with ounded corners. If put up in packets of a dozen, should think they would be appreciated.

Carbon Transparencies.—Dr. Phipson gives the suboined *résumé* of a method of obtaining transparencies y the carbon process:

Gelatine	30 parts.
Sugar	4 "
White Soap	3 "
Coloring Matter	1 part.
Water	96 parts.

Commence by placing the gelatine, the sugar, and he soap in cold water; then place the whole, which as previously been allowed to repose for an hour, in recipient kept over a water bath, until the gelatine s completely dissolved. The coloring matter is then ncorporated. This last is first thoroughly powdered, hen wetted with water, and finally gradually diluted vith the gelatinous solution; when a homogeneous nass been formed it is dissolved in small portions n the solution of gelatine yet hot; then the whole is assed through gauze. The emulsion is now ready for se. To coat the paper, it is first necessary to wet it, hen to use one of the following processes: Simply loat a sheet of paper on the emulsion kept liquid, or, etter still, pour over a glass plate of sufficient size the necessary quantity of emulsion, then place the pap over it. If care has been taken to talc the plate us as a support, the paper, when dry, will present a extremely brilliant surface. The coloring matte used vary with the desired tints; India-ink, more less mixed with other colors, is generally used. He is the composition of some of these mixtures:

Warm Black.

India-ink	15 parts.
Vandyke Brown	2 "
Venice Red	2 "

Intense Black.

Ink	20 parts.
Indigo	5 "
Carmine Lake	1 part.

Purple Black.

Ink	5 parts.
Indian Red	5 "
Burnt Amber	5½ "

After the preparation of the paper it is sensitize with bichromate and developed by the ordinary process. The majority of our readers will, however, fin it more convenient to use the ready prepared carbo tissue for the above process. This tissue is no readily obtainable.

Enamelled Carbon Prints.—A plate of transparen glass can, for this purpose, be rendered equivalent t one of opal very easily in the following manner Clean one side of the glass perfectly; then soften piece of double transfer paper in warm water in th usual way, and squeegee on to the glass, and allow it to dry; when dry, immerse in a dilute solution o alum for a few minutes, rinse, and again allow it t ry. Now, if the print be developed on the other de of the glass, there will be no more difficulty in dging of the development than if opal glass were sed. The paper backing, being unaffected by the arm water, by reason of its coating being rendered nsoluble, will last for scores of developments. Ineed, the only deterioration it is likely to undergo is echanical injury.

Uranium Toning of Platinum Prints.—Mr. J. S. eape succeeded in toning some platinum prints ith the ordinary ferridcyanide of potassium and itrate of uranium intensifier, from which Mr. A. addon inferred that, as platinum has no reducing ction on the ferridcyanide, silver must be present in e platinum paper, the more especially as he had iled to tone platinum paper of his own preparation. pon treating the paper for the presence of silver ith mercuric chloride and hypo, as well as with ichromate of potash and hydrochloric acid, Mr. eape still succeeded in toning the pure platinum nage; so that the silver theory falls to the ground, nd we are led to believe that, after all, platinum does educe potassium ferridcyanide to the state of ferroyanide.

Method of Preparing Platinotype Paper.—Herr Wateck, in a recent number of the *Rundschau*, says: Paper is coated with a solution of:

Arrow-root	1 gramme.
Cold saturated solution of Sodium Oxalate .	50 c.c.

e solution being boiled until the sediment dissolves, nd, according to the degree of porosity of the

paper, being applied to the latter two or three tim
For black tones the dried paper is sensitized in

Saturated solution Potassium Chloroplatinite	5 c.c.
Saturated solution double Oxalate of Soda and Iron	8 c.c.
Saturated solution Potassium Chloride	3 drops.

For sepia tones the following quantities of saturat
solution are taken:

Potassium Chloroplatinite	5 c.c.
Double Oxalate of Soda and Iron	4 c.c.
Neutral Oxalate of Soda	3 c.c.
Mercuric Chloride	1 c.c.
Potash Chlorate	3 drops.

More chlorate increases contrasts and a small
quantity of mercury gives darker tones. The sol
tion of double oxalate of iron and soda being sens
tive to light, it should be preserved accordingl
Both solutions given above suffice for coating a she
of paper 40 by 56 centimetres. For the best resul
the paper should be dried at a temperature of 35° C.

How to Mount Commercial Work.—I enclose t
the editor a print mounted on "thin" albumen paper.
I will describe the method of preparing the same:

Immerse the albumen paper for fifteen minutes in
solution of alcohol, 3 parts; water, 1 part; to whic
has been added a small quantity of spirits of campho
The paper is then drained and dried between blotter
The alcohol solution can be used again and agai

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* The print is perfectly flat. Mr. Courtney's method seems exceller
—Ed.

/hen ready for mounting, I place both prints and bumen paper in the following solution:

Alcohol	1 ounce.
Glycerine	1 "
Water	4 ounces.

ntil they are well saturated with the solution; they e then placed for mounting, face down, the albumen aper in one stack, the prints in another; they are ıen squeezed to remove the surplus solution, and ood up to drain. The prints are then pasted and id on the back of the sheets of albumen paper and ell rubbed down; be careful to exclude all air from etween the prints and the albumen paper. They are ıen laid out to dry on clean cloth or blotters.

When about dry they will be found to be somewhat rinkled and curled. I then place them one on top f the other and weighted down, to remain for about alf an hour, or until ready for burnishing, when they ave *sweated* out flat and are in good condition for he burnisher.

Having seen inquiries for preparing commercial ork in your columns, and not having seen this ıethod published, I submit it for publication in your *Iagazine*, with the hope that it will be of benefit to ome of your readers who do commercial work.—. V. Courtney, *in Wilson's Photographic Magazine.*

Photographing on Egg-shells.—This is becoming uite popular in the United States. To sensitize the gg-shell it should first be sponged lightly with a en-grain solution of common salt, and when dry it hould be freely brushed over with a forty-grain solution of silver nitrate, and again be dried. Sm vignette subjects, whether figures or views, are be adapted to this style, and a thin film-negative shou be used. To hold the film-negative in position, piece of soft black twill having a hole in it of t required shape is convenient, this being tied in bunch at an opposite point.

The egg is now taken out into the full light, a the edges of the hole in the black twill are turn up a little and adjusted while the sensitized part the egg-shell is exposed to light, and with a little ca a very delicate vignetting effect is obtainable. Aft washing out the free nitrate of silver, an ordina acetate toning bath may be used, and all that remai to be done is to fix and wash.

BROMIDES.

The workers with bromide paper do not receiv very much attention at present, and so literature o that subject is not plenteous. If there was a wan there would, of course, be more supply. The disposition for "shine" is the prevailing one now, and s "Aristo" and its fierce compeers are in the lead.

One of the most active and skilful bromide prin ers is Mr. J. Weir Brown, who, by means of th *British Journal*, gives us some helpful hints, as follows

"The iron developer should never be used, for it almost sure to stain. I prefer amidol, and find wha follows to give a convenient strength:

Stock Solution Recommended by Makers.

Amidol	20 grains.
Sodium Sulphite	200 "
Water	2 ounces.

Developer for Bromide Prints.

Stock Solution	60 minims.
Potassium Bromide, 10 per cent.	2 "
Water	1 ounce.

The bromide may be omitted with the slower papers.

"It will be found that a shorter exposure will be sufficient with this developer than with ferrous oxalate. No clearing bath is required, and the prints may be transferred after a slight rinse to a plain fixng bath, or, if preferred, to one containing one ounce of bisulphite of soda to each pint of hypo. I use the atter myself.

"The prints must now be thoroughly washed. The slightest trace of hypo coming in contact with the toning solution will result in a crop of red blotches. To insure the elimination of the last trace of the fixing salt it is well to submit the prints to the following bath:

Peroxide of Hydrogen (10 vols.)	1 part.
Water	20 parts.

"Keep the prints moving in this for seven or eight minutes, and follow with another five minutes' washng in water. They are now ready for toning, or they may be dried and laid aside until a more convenient season. The toning bath is as follows:

Uranium Nitrate	½ grain.
Potassium Ferricyanide	½ "
Strongest Acetic Acid	15 minims.
Water	1 ounce.

"The uranium and ferricyanide may, for convenience of measurement, be kept in 10 per cent. solutions

—separate solutions, of course. The print begins t change to a dark-brown color very soon after im mersion in this bath. Keep it moving, by the way The action can be arrested at any stage by the appl cation of running water, but as a slight amount o warmth is lost in the washing and drying, the tonin may be carried a little beyond the color it is desire to finish.

“For the production of the chalk-reds or Barto lozzi prints the development should be carried farthe than for brown tones. Every detail in the high light should be well out, and a little stronger than woul be desirable in a finished print. Fixing and washin being the same as for brown, the toning must be car ried to its extreme limit. The print will now be of black-red color. Clear away the yellow stain, and a soon as this is accomplished pass the print throug a reducer. The blackness, which consists of silve still unchanged by the toning agent, will now b dissolved out, and a good chalk-red should b left.

“Sea-green or blue-green tones, suitable for se and sky subjects to which it is desired to give th effect of moonlight, may be easily produced by uranium toning, but such colors are, of course, only suitable for the class of subjects indicated. I have fine bit of stormy sea with rocky foreground an wind-torn clouds, which, treated in the followin way, resembles the color in the carbon printin which is frequently adopted for such scenes. Th print is toned to a red-brown hue, all the procedur being as usual. After clearing it is immersed in bath of weak perchloride of iron and hydrochloric acid, which may be made up as follows:

Perchloride of Iron	1 part.
Hydrochloric Acid	2 parts.
Water	300 "

"This is intentionally a very weak bath. If it were used of anything like the usual strength, the action would be so rapid that the red-brown would be almost instantly changed to a bright Prussian-blue. When diluted as above, the action can be observed comfortably. The lighter details first begin to put on a blue-green tinge, and the deeper shadows soon follow suit. It is advisable to arrest the action while the deepest shadows are still of a brown tone, or the final result is apt to be too blue. A short washing in running water will effect this, and the print can then be blotted off and dried in the usual way.

"On removing the enlargement from the toning solution it will be found that the whites are stained a bright lemon color. To remove this it is transferred to running or frequent changes of water. The high lights will be quite cleared in six or seven minutes, but the washing may be continued if the color is now found to be too warm, and a gradual reduction of tone can be observed. When the desired point is reached the print should be quickly drained and then pressed between sheets of clean, hard blotting paper. This is an essential part of the procedure, and the neglect of it has been the cause of a good many of the failures that have been submitted to me by correspondents seeking advice. The surface moisture having been evenly removed in this way, the print i set aside to dry and is ready for mounting.

"In conclusion, I would point out what hav proved to be the most common sources of failur submitted to me by inquiring correspondents. Thes are imperfect elimination of the hypo and neglect o blotting off all surface moisture before the toned prin is set aside to dry."

A Developer for Bromide Prints.—At a recent meeting of the Putney Society, Mr. Kidd gave the subjoined formula for obtaining brilliant bromide print by development:

1. *Oxalic Solution.*

Potash (neutral Oxalate)	16 ounces.
Acid (Citric)	1 drachm.
Hot Water	50 ounces.

2. *Iron Solution.*

Iron Sulphate (pure)	15 ounces.
Acid (Citric)	1 drachm.
Hot Water	30 ounces.

3. *Bromide Solution.*

Bromide of Potassium	1 ounce.
Water	20 ounces.

For use, take six ounces of No. 1 and add one ounce of No. 2 and a few drops of No. 3; mix in the order given immediately before development. In his opinion, this development gave the purest blacks and whites, and, consequently, brilliant results. Only such a quantity of bromide of potassium should be used as it might be absolutely necessary to bring the developer under control, as an excess would tend to produce greenish tones. The solutions must not be alkaline, and, when mixing, it is necessary to add the iron to the potash, otherwise a deposit will form and make the developer muddy.

Warm Tones on Bromide Paper.—The following developer, due to Mr. Hector Colard, gives brown or sepia tones in using bromide of silver positive papers. Prepare three solutions.

A.—Water	1000 parts.
Neutral Oxalate of Potash	330 "
B.—Water	1000 parts.
Chloride of Potassium	130 "
C.—Water	500 parts.
Sulphate of Iron	24 "
Citric Acid	2 "
Bromide of Potassium	2 "

For use, mix twenty parts of A, five parts of B, and five parts of C. By increasing the quantity of the solution B (chloride of potassium) the tone which, with the proportions above, was sepia, becomes of a darker red and turns to a brown.

Discoloration of Bromide Prints.—Mr. W. Ethelbert Henry says: "Any dirty discoloration may easily be removed and the print made thoroughly marketable by the following treatment: Prepare a strong solution of potassium cyanide, and in it dissolve iodine until it assumes an almost purple color. At this stage add a further small lump of cyanide, which will render the solution colorless, in which state it will be ready for use at any moment. It is advisable to label this mixture 'POISON,' and store it in a place of safety, as its action is very violent.

"To use: Place a print, while still wet from the washing water, face up, on a clean glass plate, and with a pledget of cotton wool apply a little of the mixture to the extreme outside edges. Do this quickly, and gradually cover a larger surface, using a more dilute solution, as the solvent is brought near to the lines of the picture itself. Let water run on the centre of the print at frequent intervals while watching the progress of the clearer. The discolored edge will readily assume a pure, snowy white appearance, which will probably cause the high lights of the print to look muddy by contrast. If this be the case, dilute a little of the solution with ten or even twenty times its volume in water, and immerse the whole print therein for a few seconds, when a wonderful improvement will be manifest.

Immediately upon the print assuming the desired purity of color, plunge it into clean water and wash thoroughly.

The same preparation will be found very useful in case of uneven vignetting; and for the salvation of over-developed prints it is invaluable.

It is also highly effective for heightening effects upon bromide prints upon opal, where purity of the high lights is of such vital importance, and there are many other ways which will suggest themselves to my readers in which its intelligent use is a positive gain.

How to Obtain a Long Exposure on a Wet Plate Without Drying or Markings.—During the "Centennial Exhibition" at Philadelphia, the Centennial Photographic Company turned out some wonderful work in interior photography.

Some of the large plates excited wonder at their remarkable definition, showing long exposures—clean and brilliant.

Many were the questions asked of one another as to the method by which this was accomplished.

Some suggested "water in the collodion," "bath filled with glycerine," "re-dipping," "wet cloths in the box;" all the thoughts could not get in straight; it was a puzzle, and is a secret to this day—at least to me, as I have never seen it print. Mechanical photographers to-day have to make exposures sometimes longer than they used, and many are still troubled with the same difficulty, to keep their plates from having the various markings of "suction," "oyster-shell," "crystallization," especially at the thin end of the plate.

To those who are troubled I make this suggestion: Have a plate glass, perfect, about one-eighth of an inch thick, placed in front of the kit—have it so arranged that it can be easily removed.

This plate must be as clean as it can be polished; a grease stain that is not visible to the eye, but can be easily seen by breathing upon it, will make a surface mark on the negative just as it appears in the moist state.

This plate should not be less than one-eighth, nor over one-quarter inch from the negative surface; should the negative be larger than this plate, in a very long exposure the edge outside will be perfectly crystallized, while the protected surface will take the developer easily and be clean.

In addition to this I would suggest that the bath should not be overcharged with alcohol, and the collodion must be perfectly ripe, otherwise markings will ensue.

The plates must be cleaned on the back as nearly dry as possible before putting in the holder and rested on a clean blotter.—W. L. SHOEMAKER.

Points for Process Engravers.—If you have a lot of old collodion on hand, some that has turned from the color it ought to have to a beautiful (?) deep cherry red, some that not only has a beautiful color but gives beautiful (?) results, and of course you do not wish to throw it away, try the following to restore it to its former condition, and more—to make it better than before. Add a few pinches of subchloride of mercury (calomel) sufficient to turn it a greenish color after shaking. Let it settle; if it be now of pale canary color, all well and good; if not, add a trace more of the calomel, allow to settle, decant and filter. I'll wager that you will have collodion as good as when it was first made. I can almost see you smile and say, "The idea! calomel is a substance entirely foreign to collodion, and should never be used in it." But I say in reply that "practice is better than theory," and that I know whereof I speak. I had two pounds of collodion I had condemned, and after treating as above it gave negatives that I have never seen equalled for richness, color and all that is desirable in a wet-plate negative for process work.

An almost indispensable article in printing on metal is an exposure meter. By its use there is no guesswork and the print is right every time, no matter what are the conditions of the weather. To make one, proceed as follows: Procure a piece of onion-skin paper or tracing cloth, cut out a piece 4 x 5 inches in size, and on this mark a square 3 x 5 inches. Divide this in turn into ten smaller squares, each being 1 x 1½ inches. With thick India-ink number the squares from one to ten consecutively. Then, having previously cut a number of pieces of the tissue 1 x 1½, glue them (just touching the ends) over the squares, placing two of these pieces over the square marked "two," four over "three," six over "four," and so on. This completes the meter. Nothing remains now but to place the meter in a 4 x 5 printing frame, placing a piece of sensitized paper back of it, and putting in the light with the frame for printing on metal.

Two or three experimental trials will show what tint must be reached when the metal has been exposed just the right length of time, and once decided, all your exposures must be correct.

Suppose the figure eight just shows, and on developing the plate you find the time to have been correct, then expose until the same tint is reached the next time. Much better then trying to time with a watch, and not much more expensive. "Aristo" seconds are good for the meter, and they will keep a long time.

HELIOCHROMY.

Photography in the colors of Nature continues to be a topic of interest among photographers in all parts of the world. The principal achievement in this direction during the year was announced in the May issue of *Wilson's Photographic Magazine*, with which a half-tone etching of a group of vegetables photographed in natural colors by the Vogel-Kurt method was given. This method is that invented by Dr. Vogel, of Berlin, in conjunction with his son, Dr Ernest Vogel, and Mr. Ulrich, a color printer of tha city. Under the personal superintendence of Dr Vogel this process has been successfully introduced commercially by Mr. W. Kurtz of our city. The illustration in natural colors referred to attracted much attention and admiration as the first photograph in the colors of Nature ever given in any American photographic magazine.

The *Ives Heliochromic* method has been demonstrated by Mr. F. E. Ives, its inventor, before the Royal Society of London, and won for Mr. Ives considerable praise among the English scientists. The Photographic Society of Philadelphia awarded to Mr. Ives a gold medal in recognition of his work in this direction.

Messrs. Lumière, the distinguished French experimentalists and chemists, have by following the method of heliochromy indicated by Prof. Lippmann, secured colored photographs of the spectrum on bichromated gelatine and albumen films. The work of these gentlemen formed part of the Lumière exhibit in the French section of the Chicago Exposition.

Mr. R. D. Gray, the optician, has also diligently pursued his work in heliochromy. Notices of his progress have appeared at various times in *Wilson's Photographic Magazine* during the year. The results obtained by Mr. Gray are completely successful when shown by projection upon the screen. For the prouction of heliochromic prints Mr. Gray employs the ollotype process.

Mr. H. Krone, a teacher of photography at the Technical High School at Dresden, Germany, who an look back upon fifty years of photographic expeience, has issued an interesting pamphlet dealing ith heliochromic investigations.

Mr. Krone's pamphlet shows a wide-horizoned, horough knowledge of the ground gone over. To ven hint at all it contains, let alone to dwell on the eferences to other productions from his pen, suplementary to this pamphlet, cannot be our present urpose. Those interested could not go to a more opious source of information.

One would naturally suppose that men like Mr. Krone and others, after the success with spectra, would be most sanguine in their hopes of fully solving he problem of color photography so as to make it vailable for the professional photographer. The very reverse is true, at least of Mr Krone. The oubts he expressed fifty years ago he still feels and maintains.

"Many roads lead to Rome."

In the light of man's accomplishments in the past, we incline to lend a listening ear to the prophet's still small voice, telling us: It will be done.

PHOTOGRAPHY IN ASTRONOMY.

In hardly any deparment of science does photography help so wonderfully as in astronomy. Its record in this direction is full of interest to all.

Photography has now been so developed that an astronomer may sit in his study and with a micromete examine a photographic plate, thereby securing a exactness of detail unattainable by direct telescopi observations. Half of the astronomical observation will henceforth be done without looking at th heavens.

Photographic lenses can be used in ordinary telescopes. In the Danish University Observatory ther is a measuring apparatus upon the correction o which two years' labor has been spent It is no ready, and Denmark is now the only country whic possesses an adjusted apparatus. Professor Thiele who is in charge, enjoys, since his work in the Pari Congress, 1887, a universal reputation for measurements on photographic plates.

The most recent discoveries are those by Dr. Ma Wolf, in Heidelberg, who, by an ordinary photographic glass for an astronomical telescope, discovere five new planetoids in a few months, besides a grea many nebulæ. Planetoids show themselves as smal streaks on the plate, and the length of the streaks represents their course during the time of exposure.

Mr. Common, the eminent English astronomer, ha a gigantic reflecting telescope, the disk of whic measures five feet. The work accomplished wit this new reflector is looked forward to with considerable interest.

In a lecture upon astronomy, delivered recently Prof. Barnard, of the Lick observatory, said:

"Two important agents had recently come int use in astronomical research, namely, photograph and spectrum analysis. In photographing the great comet of 1882 an extraordinary number of stars were noticed on the plate. This led to photographing other portions of the heavens, with brilliant results. When Wolfe, an expert observer in the Paris Observatory, had counted and charted 670 stars he proclaimed that he had sounded the depths of space; but the brothers Henry, by a photographic exposure of one hour, revealed 1400 stars, and another exposure of four hours brought out 2360 stars, more than thrice the number visible to the eye through the same telescope."—*Times*, Los Angeles.

This photographic department of research has been applied to the discovery of asteroids, of which there are now about 350. In September last no less than four of these minor planets imprinted themselves on one plate in Heidelberg, of which three were new.

Comet Number Two of 1893.—This comet has been photographed by M. F. Quénisset, and the result communicated to the Paris Academy. It was obtained by means of a Hermagis lens of sixteen cm. (about six and a half inches) aperture and an exposure of forty minutes. The comet shows two tails—one a degree, and the other half a degree long.

Eclipse Photographs.—In the *Observatory* Mr. Turner makes some remarks about the August, 1896, eclipse and reviews the photographic results of the late eclipse. He informs us of one point which appears to us the least satisfactory, namely, that the photographs taken of the corona are in the hands of an astronomer who will make drawings of them. Far better publish the photographs and let them illustrate their own story. Mr. Turner heartily congratulate the observers on their performances. Professo Pickering employed one of Dr. Common's twenty inch reflectors of forty-five inch focus, and used slo plates, the result being that he has got more deta in the inner corona than is shown in the Englis photographs. Regarding the 1896 eclipse, Mr. Turne points out the importance of making preparation beforehand. He says it is not a bit too early to begi at once, for, owing to the position of the central lin of totality being so favorable, it is probable that host of observers, both professional and amateur, wil be able to co-operate in the observations.—*Britis Journal of Photography*.

In an interesting paper communicated to the journal, *Astronomy and Astro-Physics*, the Rev. G. M Searle advocates the use of short-focus lenses fo stellar photography. Greater exactness and accurac are thereby secured, with other advantages.

APPLICATIONS OF PHOTOGRAPHY.

Photography is now being made to record th movements of the growing parts of plants. Especially curious are the results from certain climber such as the hop, convolvulus, isomœa, etc. Th young stems move in a succession of irregular circular or elliptical curves, which vary every momen even in direction, and are due to irregular growth i different parts of the stem. During the sleep o plants movements do not cease, but consist of alternate upward and downward vibrations.

Photography and Ethnology.—One of the earliest an most useful applications of photography was an aid to the study of ethnology. Daguerre slipped away a little when he chose a landscape as the material for his first picture, but he was soon brought back by his disciples and followers. Ever since the forties, then, the camera has been busied photographing the races. There are more earnest ethnologists tramping and focussing around the world for typical specimens of mankind than the most of us are aware of.

Mr. E. F. im Thurm, recently gave a paper on this topic before the Anthropological Society of Great Britain. He points out that, in taking photographs of savages, special care has to be taken to avoid getting them in that " non-natural " state so often characteristic of such pictures. For example, he has seen the same savage native in a town and in the country, and he looked like two different individuals, though his costume was little more in each case than a yard of tape—literally, a single strip of cloth about a yard long and two or three inches wide.

Instantaneous Photography with the Electric Spark.—To give an idea of the rapidity of the actinic action of the electric spark we may mention the results of the last experiments of Prof. Vernon Boys, who in his discourse at Edinburgh on " The Photography of the Electric Spark," said that by his method it is possible to reproduce on the plate objects moving with a velocity of 3333 leagues an hour. The actinic power of the spark is exerted in the *ten-millionth part of a second;* it is in this so short interval of time that the image of the object in motion is traced, as a stationary object, on the sensitive plate.

Photography and Apiculture.—At a meeting of th London Photographic Society there was shown series of prints made by Mr. Freshwater, representing the divers phases of apiculture, and the autho has recently presented them to the Photographi Association. On that occasion he gave several instructive and interesting details in the raising of bee the construction of their hives, the taking of thei honey, and their ways, etc. It appears that thes insects do not sting the operators when they (the bees have been well fed with honey and are not hungry Those persons who have been often stung become s accustomed to the slight wound and to the effects o the poison of the sting, that they do not suffer fro such an accident.

A young Boston woman who has a weakness fo novelties has invented a new way of marking he belongings. Indelible ink she scorned as belongin to the distant past, and embroidered monograms an initials she voted commonplace. Even the pretty device of embroidering her posessions with he favorite flower finally lost its charm, and her lates fancy is to have her own face reproduced.

She had some tiny and not unflattering photographs taken, and they are now being transferred t the corners of her handkerchiefs, the bands of her skirts, the capes of her collars, and all other places where the sign of possession is usually fixed.

At a recent International Congress of Physiology at Liége, Professor Hermann demonstrated his method of photographing the sound of the vowels. The vowels were sung out before one of Edison's phonographs. Immediately afterward they were reproduced very slowly, and the vibrations recorded by microphone. The latter was furnished with a mirror, which reflected the light of an electric light upon a registering cylinder, covered with sensitized paper, and protected by another cylinder with a small opening which gave passage to the rays of light from a reflector. By this means were obtained very distinct photographic traces, and the constancy was remarkable for the different vowels.

Highly Persistent Soap Bubbles.—M. Izarn has communicated to the Academy of Sciences a new method for obtaining soap bubbles lasting a much longer time than those obtained from the soap-water generally used. He has recourse to a resinous soap made by the following formula : Pulverize together 10 grammes of pure rosin and 10 parts of carbonate of potash ; add 100 parts of water and boil until complete solution ; we obtain in this way a thick solution which may be kept in stock to be diluted for use with from four to five times its volume of water. Caustic potash did not give as good results, and soda, or its carbonate, still less so. The liquid, always slightly turbid at the ordinary temperature, has this advantage over the liquids made with glycerine, that it can be kept indefinitely even when exposed to the air.

The bubbles produced with this liquid are very persistent and, consequently, can be made useful in the study of the phenomena relating to thin laminæ and in making photographs in which soap bubbles play a part.

At a recent meeting of the French Academy of

Sciences an apparatus was shown for use in measuring the weak luminous intensities. By means of this instrument it was found possible to measure the diffused light of stars on a clear evening in August. The intensity of this light was determined to be equal to that of a candle placed at a distance of 125 feet.

The Unknown Dead.—James M. Fullerton, the superintendent of the public morgue, Pittsburg, Pa., has made arrangements with Coroner McDowell to photograph all the bodies hereafter on which inquests will be held. Mr. Fullerton is an amateur photographer of some note, and is equipped with all the necessary paraphernalia to conduct the work in a satisfactory manner. Some years ago, when he operated the morgue, he photographed all the subjects coming under the notice of the coroner, but in severing his connection with the morgue he discontinued the practice. The coroner has long desired some system whereby he can keep an accurate record, especially of unknown dead, and the plan adopted by Mr. Fullerton will meet the requirements exactly.

Photographs will be made and kept in a case or rack, always ready for inspection. A record book will be kept to correspond with the rack and the photographs in it. The book will contain a blue print corresponding in number to the photograph, and also an accurate description of the subject, the age, height, weight, complexion, marks etc., together with a description of the clothes, contents of the pockets and a brief account of the circumstances of death. The book will likewise be open for inspection at all times, and is expected to facilitate the identification of missng acquaintances for many years after they have een lost sight of. There is no doubt that had this ystem been in practice heretofore 50 per cent. of he persons buried in unknown graves would have een identified in time.

Finger Prints.—"The occupation of finger-printing," ays Francis Galton, "would fall naturally into the ands of photographers, who, in addition to being ound everywhere, are peculiarly well suited to it, for aken as a class they are naturally gifted with manual exterity and mechanical ingenuity." Many methods f taking the prints are described in "Finger Prints;" ll consist essentially in pressing the inked finger on suitable surface. Ordinary copying ink and a sheet f paper will do, though it is difficult not to get too uch ink. When taken the prints should be photoraphed on an enlarged scale, and the operator thus ets a series of very interesting and absolutely unmisakable additions to the photos of his friends. His ork also has considerable scientific value. Mr. alton is at present engaged in enlarging a series of ypical photos, and says they come out very well on a ve to six-fold scale, and are easily made and printed hen the proper method has been acquired. There s no doubt that at an early date the making of such hotographs will be one of the duties of our criminal epartment, and the photographer may find that the bility to make them with success is most excellent."

MISCELLANY.

Wonders of Photography.—Electricity has been oing some pretty work in the photographing of drops of water, and Prof. C. Vernon Boys, in a recen lecture, gave illustrations of what had been done He first showed photographs taken by the electri spark of soap-bubbles in the act of bursting, an explained the process by which it is possible t ascertain the respective speed at which different soap-bubbles burst. One photograph showed an issue o liquid from a very small pipe, which to the naked eye appeared to be a perfect stream, but which, on an electric photograph being taken, was resolved into a beautiful and regular series of drops. In connection with this, Prof. Boys remarked that the science o liquids and of the forces involved in the phenomena of the surface of liquids was one of the most interesting branches of physical science. The effect on a fountain of playing or singing was to change its appearance into one, two, or three apparently separate, clear streams of liquid, but a photograph taken as a tuning-fork was struck demonstrated that the water was disposed in drops in perfect regularity.

A Cold Varnish good for negatives or positive films, or, when slightly diluted, for large prints, is given as follows by Herr Valenta:

Benzol	90 parts.
Alcohol	10 "
Gum Damar	8 "

First dissolve the gum damar in the alcohol and then add the benzol. This varnish is necessarily inflammable.

Ink for Writing on Glass.—Put into a bottle:

Bleached Shellac	10 parts.
Venice Turpentine	5 "
Oil of Turpentine	15 "

Heat the bottle and its contents in a vessel of hot vater, or water bath, and when the contents are horoughly dissolved add 5 parts of the finest lamp-lack.

Retouching Varnish.

Gum Damar	30 grains.
Venice Turpentine	6 "
Rectified Turpentine	4 ounces.

issolve a little to be rubbed on the negative, and the urplus is wiped off with a pledget of cotton-wool fter a few seconds. At the date that the above was ommunicated to us, the gelatine plate was a thing f the future; hence it will be seen that the medium vas intended to be used upon the varnish. We may ay, however, that (when made stronger) it has been n frequent use for working direct upon the gelatine.

A Remedy for Bichromate Poisoning.—Photographers sing the carbon process sometimes find their hands overed with colored spots, which indicate local oisoning by the absorption of chromic acid. These pots increase in size, spreading to the back of the he hands and wrists, finally dying away, leaving the kin in a cracked, painful condition. Rubbing the ands with a mixture of ammonia, carbolic acid, and lycerine is recommended as an effective cure. The ollowing ointment is given as a cure for this trouble, n the *British Pharmacopæia:*

Mercury, by weight	4 ounces.
Nitric Acid	12 fl. ounces.
Prepared Lard	15 ounces.
Olive Oil	32 fl. ounces.

Dissolve the mercury in the nitric acid with the id of heat, melt the lard in the oil in a water bath at about 212° Fahr., add the solution of mercury the same temperature, and mix thoroughly. Th mixture should be heated until it froths when stirre and stirred until cold.

In France thin aluminium is being used instead card for visiting "cards," and the suggestion ha been made to use aluminium plates covered wit black varnish as a basis for such positives as are no known as "ferrotypes." These uses of aluminiu would make "card" and "ferrotype" misnomers i the same sense that the term "pen" is a misnome when applied to a steel writing instrument. Progres in technology certainly increases the cares and labo of the philologist.

Dr. Sumpner says that the amount of light reflecte from a piece of newspaper is about nine-tenths that reflected from a good mirror, and his investiga tions as bearing on the lighting of a room are a follows:—Black cloth covering the wall of a roo requires proportionately 100 candles to light it; dar brown paper, 87; blue papers, 72; yellow paint, 60 clean wood, 50; dirty wood, 80; cartridge paper, 20 and whitewash 15 candles. It thus takes nearly si times as much to illuminate a room papered wit dark brown paper as it does to illuminate a white washed room.—*Photo-Work.*

To Neutralize an Acid Solution of Sodium Sulphite.— For this purpose Mr. Chapman Jones advises th addition of two or three drops of strong hydrochloric or two or three grains of citric acid, to each *tw* ounces of crystallized sulphite after solution. Fo general photographic use a fifty per cent solution ulphite is recommended. To keep such a solution properly it should be put up in convenient sized bottles, illed to the neck, and closed with India-rubber corks f possible. When preserved in this way the solution will be found reliable for many months after preparation.

How to Detect Resin in the Sizing of Paper.—Herzberg proceeds in the following manner. A piece of the paper is placed on a horizontal support, and light is reflected upward under it, so that the observer can look downward and see the paper by transmitted light. Ether is now allowed to fall on the paper, four to six drops being sufficient. If the paper has been sized with resin, a bright translucent ring is left after the ether has evaporated; but in some cases a repetition of the treatment may be necessary to obtain the ring.

Photography on Wood.—Questions as to the best means for photographing on wood are constantly recurrent, and the *Scientific American* quotes the following method according to Lalleman. The surface of the wood, and that only, is imbued with a solution of alum and allowed to dry spontaneously or at a gentle heat. The entire block is then coated with a mixture of animal soap, gelatine, and alum. The following is the compound:

Water	100 parts.
White Soap (Castile)	2 "
Gelatine	2 to 3 "
Alum	1 part.

The solution to be used warm. When dry, the surface which is to receive the image is placed for a minute or two in a solution of hydrochlorate of ammon (chloride of ammonium 2: 100), and again allowe to dry. It is then sensitized with a bath of nitra of silver 1: 5 and dried in the dark. A negati either on glass or on paper is then applied on th surface of the wood in a pressure-frame made for th purpose, which allows the progress of the printin to be watched. The image is fixed in a strong solu tion of hyposulphite of soda, and then washed fo five minutes only. The sizing protects the woo from any moisture, and an eight months' experienc has proved that the use of alum, instead of loosenin the texture of the wood, gives it a great toughnes which is favorable to the engraving.

"Bronzing" with Hot Hypo.—A hot solution c "hypo" wlli produce a bronzing or "platina" on zinc in fact, just the greenish or greenish-brown tint which the makers of ornamental castings in zinc ain at. An immersion for a few minutes in a nearl boiling ten per cent. solution gives a deep gree bronzing; while for greenish-brown the followin is used:

Hot water	1½ pint
"Hypo"	1 ounce
Chrome alum	1 "

In every case the zinc must be clean and bright.

A Nearly Waterproof Glue or Cement.—A kind o emulsion cement well spoken of is the following Dissolve of gum sandarac and mastic each five and one-half drachms in one-half pint of alcohol, and add five and one-half drachms of turpentine. Place the solution in a glue-pot over the fire, and gradually tir into it an equal quantity of a strong hot solution of glue and isinglass; strain, while hot, through a cloth.—*Photo. Work.*

ASSOCIATIONS AND CONVENTIONS.

The year 1893 will be notable in history for its many photographic gatherings in various parts of the world. *The London Camera Club* held its seventh annual conference in April. It comprised a gathering of many of the best English amateur workers. The papers read before the conference bore chiefly upon the scientific side of photography. The Convention of the Photographers of the United Kingdom was held at Plymouth, England, in July, and proved a great success socially and photographically.

The Photographers' Association of America met at Chicago, July 18th to 21st. Partly by reason of defective management, and also because of lack of nterest, this convention was by no means so successful or so useful as in the past years. It was practically devoted to the exploiting of aristo papers. In August the Photographic Congress in connection with the World's Fair took place at Chicago. It was not argely attended, but many useful papers were presented bearing upon the services rendered by photography to the arts and sciences. These papers have been given in *Wilson's Photographic Magazine*, and form a considerable contribution to the literature of the year.

The World's Photographic Congress was held at Geneva, Switzerland, in August. At this Congress Dr. Liesegang presented a paper upon his investigations toward a new fixer for negatives, details c which may be found on another page. The Photographers' Association of Ohio met in convention a Columbus, Ohio, August 8th to 11th. This conventio must be regarded as the most useful gathering o the year for the American photographers. No paper were read upon photographic work, but the exhibition and demonstrations proved of great value.

The Nebraska and Iowa Associations also hel conventions in their respective States during the year but appear to have been somewhat ineffectual o good.

The Photographic Convention of Canadian Photographers was held in November, with the usual spiri and earnestness of purpose.

A Photographic Congress.—During the annual exhibition of the Photographic Society of Great Britain in October, a congress was held at the rooms of the Society of Arts. The papers read at this congress were of unusual interest, many of the leading authorities in the English photographic world having sent contributions.

A professional association has been formed a Hartford, Connecticut, the only effort of this kind initiated during the year. This association was formed to frustrate an attempt made in the Connecticut Legislature recently to pass a law providing "that all plates and negatives shall be the property of persons ordering photographs." Several photographers were called before the Judiciary Committee to give testimony, and after hearing *their* side the bill was not considered further.

THE LITERATURE OF THE YEAR.

As the scope of photography widens, its literature shows a corresponding increase. Each year exhibits added activity in photographic bookmaking, and the number of periodicals devoted to the art-science are becoming so numerous it behooves the photographer to select his literature very carefully nowadays. Many periodicals are wholly or in part published for the benefit of manufacturers and dealers, and the photographer cannot expect to obtain from such journals the disinterested help and information given in magazines independent of stock-house influence. Among the books of the year we give here a list of those only which can be of service to the English-reading photographer:

Picture-making in the Studio by Photography, by H. P. Robinson; *The Lighting in Photographic Studios*, by P. C. Duchochois (2d edition); *Amateur Photography*, by W. I. Lincoln Adams; *An Adventure in Photography*, by Octave Thanet; *Elementary Photography*, by J. A. Hodges; *The Amateur Photographer's Annual*, edited by E. J. Wall; *Photography Annual*, edited by H. Sturmey; *Portfolio of Prize Photographs; The Grammar of Photo-engraving*, by H. D. Farquhar; *On Telephotographic Lenses of Moderate Amplification*, by T. R. Dallmeyer; *The Blue-book of Amateur Photographers, English and American*, by W. Sprange. *Catalogue of the Library and Museum of the Photographic Society of Great Britain. Industrial Photography*, by P. C. Duchohois.

OBITUARY.

Since last April, when Mosaics 1893 was published not many of our co-workers have gone over to th great majority; but, alas! of those whom Death ha claimed, some are old personal friends, and one especially in whom many bright hopes were centred.

R. J. Chute, a professional worker, formerly o the staff of our *Magazine*, died at Buenos Ayres March 26th.

Emile A. Letellier, editor of the *Revue Photographique* of Paris, and an enthusiastic photographer died at Paris, April 10th.

George Washington Wilson, a famous view photogapher, and one of the leaders in our art, died suddenl at Aberdeen, Scotland, March 9th.

Alva A. Pearsall, a well-known photographer died at Brooklyn, February 10th.

C. W. Loomis died at Parkersburg, West Virginia May 22d.

J. H. Hallenbeck, a veteran, for many years one of the leading spirits of New York, died at New York, March 4th.

Frederic Hart Wilson, died at Hygiene, Colorado, in the twenty-ninth year of his age, August 8th.

M. Brown, Modesta, Cal., died at his home, September 15th.

Charles Gentile, editor of the *Eye*, died at his home in Chicago, October 27th.

SECTION II.

SOME OLD THINGS STIRRED UP.

AN EXPLANATION.

BY EDWARD L. WILSON.

"In the multitude of counsellors there is safety," said Solomon. But then, when Solomon wrote that, photographic writers in book and journal did not abound as they now do. Moreover, when in Solomon's day anyone did write about anything, there was an element of sincerity and an air of experience about it which carried weight with it. Alas! judging from the complaints which come to me, many of the photographic writers of the present day are neither sincere nor experienced. Like the Third Richard, if they don't mean to, they surely do, too, most emphatically say: "And thus I clothe my naked villany with old odd-ends stol'n out of——,[1] and seem a saint when most I play the devil."

For this reason I yield to the call of many readers to republish some of the contributions of the older writers, and have selected a few to follow, with the hope that they may prove of more service than articles which come from those who are less earnest and less experienced. I am aware of the risk I run in this but I am never afraid when I feel in my heart that am engaged in the line of duty. The temptation t dodge this risk reminds me of a fable.

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[1] They don't mention the magazine or book, as a rule.—Ed.

Pardon me if I parody it a little in relating it, for must do so in order to make it suit my illustration.

L. D. Johnson, Phot. Vineland, N. J.

A complacent little bantam sat upon her nest on day, when, for the thirtieth—nay, I am too fast—th twenty-ninth time, her portly, pompous husband presented himself and said—but that's the fable:

"Say, mother chick," said father chick one day,
"Don't brood more chicks to step that ugly way.
Do hatch them out a little straighter, dear."
The mother chick made answer, with a sneer,
"Look at yourself! it's very well to talk,
But it was you who taught them how to walk:
From you and from your friends they took their gait,
If you go crooked how can they go straight."

But, writes the poet further:

> "As to the way of walking, let me add,
> That turning back has often merit in it."

Permit me then to "leave this keen encounter of our wits," and turning back ask careful reading of the old things stirred up for a few pages, following.

These have only been "edited" carefully to suit the precarious appetites of the workers of the present dispensation.

THE PRINCIPLES AND PRACTICE OF PHOTOGRAPHY FAMILIARLY EXPLAINED.

BY JABEZ HUGHES.

HOWEVER it may be in other mortals, for a certainty 'tis not in photographers to command success; and although I have given you clear and simple directions, which I have no doubt you will carefully follow, yet, my worthy Pupil, I fear that you will not be exempt from many of those troubles which most of us have encountered.

It may be a melancholy satisfaction to know that the cleverest practitioners are subject to them in common with the less skilful: the difference, however, being, that the former by perseverance overcome them, while the latter give up the contest, and are beaten.

As you have, no doubt, determined to belong to the first class, and with a view to aid you, I enumerate the most probable causes of failure.

Generally speaking, to point out the origin of a defect is also to suggest a remedy; when, however this is not evident it will be stated. It is impossible to anticipate where your difficulties will be, for the experience of no two exactly agrees, but you must endeavour to *understand* the process and to grasp the *spirit* of the directions. Above all things, resolve to be neat and clean in your manipulations, cool in your manner, and exercise an observing eye, and you will certainly escape from nine out of ten of the beginner's troubles.

Whether a person shall succeed or fail in photoggraphy depends very much on the spirit with which he commences. If he thinks the whole process a *mechanical* one, mainly a question of apparatus, baths, and developers, he has no pleasant future. When he gets into difficulty—and he soon does—he declares his chemicals are wrong, his bath is out of order, his camera is bewitched, and rushes from shop to shop to buy the last "patent never-fail collodion," or the marvellous Greek-named lens that takes pictures in a few seconds less than no time, or some other be-puffed and be-advertised nostrum, instead of stopping at home and quietly finding out in what his trouble consisted. Possibly he has mixed his plain collodion and iodizing solution in reversed proportions, or strengthened his nitrate bath out of the unlabelled hypo bottle, or been trying to develop with his cyanide. Such a man soon wears himself out, declares, "It's no use trying, it's all chance," and attributes the success of skilful men to the use of "secret dodges."

As a contrast, observe another man, who begins quietly and steadily, and, getting into trouble, thinks it very probable that it is *he*, not the chemicals, that is wrong; and instead of throwing them down the sink, perseveringly proceeds, finally discovering that the same chemicals that gave him bad pictures now furnish him good ones, the difference being only *in the mode of using them.* A man of this stamp, taking pride in his new acquisition, and not blind to his own deficiencies, reads the journals, joins a photographic society, compares notes with his *confrères*, keenly enjoys a visit to a photographic exhibition, and speedily becomes an intelligent and clever manipulator.

A LITTLE TALK ABOUT PHOTOGRAPHY.

BY JOHN L. GIHON.

Some time since I was kindly invited to contribute an article in relation to my views on the present practices of our profession. The assembling of the Association has brought me into personal contact with so many of my co-workers, that I have lost all hesitation in regard to the matter, and feel that in having some familiar chat with them I shall not expose myself to very severe censure, even though my ideas may somewhat conflict with their own. With our customers we have almost a stereotyped conversation. We comment upon the weather, the heat, o the cold, and then gradually, but surely, fall into dissertation upon the wonders of our art—its rapid growth, and the gigantic strides that have been mad in its improvement. Now, as a foundation for othe remarks, I am about to be heretical enough to maintain that photography, literally speaking, has advanced but very little during the last twelve years. There are hundreds of men, daily working, who were a that time fully as able to make a negative as clear and as perfect in photographic qualities as those that they now produce. They use the same formulæ and their manipulations are now similar in all respects to those of years ago. Before I further condemn myself, I must join with you in admiration of the modern productions, and admit their vast superiority. With the same chemicals, the same methods of working, and the same controlling hands and brain-power, we have results that are vastly different. The improvement consists in our having added to the inventory of our necessities a controlling medium—an *art element.* It is no longer our only desire to produce a photograph that will be faultless in its freedom from stains or blemishes, that will be sharp and perfect in detail, and that will most certainly be a likeness of that which is represented. We must now create pictures that can be hung side by side with the works of the painter, and that will not only show excellence in their execution, but also thought in their production. One after the other there are gradually springing from our midst masters, who are swelling the front ranks of our army, and whose efforts are receiving the admiration of the most cultivated tastes. Ask these men for their formulæ: with one accord they will assure you of their having no secrets—their processes are astonishingly alike—and are those publicly published, and probably used, though in a different way, by the most inferior workmen among us.

In this country, particularly, we have fallen into a great error. We have been endeavoring to establish *photograph factories*, and we have only too well succeeded in doing so. People come to our places generally in a hurry; to accommodate them we also use haste. The negative having been made, is given o the printer—almost invariably a man who has never seen the subject. The prints, when completed, are assorted with all due regard to the size of the photograph that has been paid for, and they are then mounted upon cards whose uniformity of design has but lately been infringed upon. The principle involved in all this is radically wrong. The same man hat receives and poses his sitter should be the one to conduct all future operations. The position may be graceful, the expression desirable, the accessories well placed, the negative be perfect in its qualities, and yet he result may not be satisfactory to the artist if he tops here and intrusts all else to other hands, without supervision on his own part.

The next operation in order will be the retouching of the plate. It is difficult for the poser to convey to he mind of another exactly the effect he desires to be produced. Hence, the utmost efforts of the negative retoucher are usually confined to the smoothing of a face or hand. There is no branch of our ar more abused. The skill and patience exhausted upon the production of a skin effect unnaturally perfect is no better directed than are the energies o the Chinamen who spend months of labor in carving upon a useless trinket.

In retouching negatives, too much labor is spent upon the face, and not enough upon the rest of the picture. Every mole, freckle, mark, or wrinkle is scrupulously removed, until expression and individuality are almost as equally destroyed. Practice and ingenuity will teach the retoucher how to lighten a shadow, to improve a middle tint, to crisp up a telling light, or to destroy the monotony of a flat background. Efforts in this direction are more to be commended than when they are confined alone to the perfection of heads, that when finished seem suitable for models to the manufacturer of waxen figure-heads for hair-dressers' display windows.

I would also advocate more attention to our printing departments. Printers are popularly considered as holding second-class positions in our profession. An artistic printer is as desirable a man as an accomplished operator. With skill, and a thorough knowledge of the requirements of his business, he can correct many a fault that has occurred in the skylight or dark-room. This branch has been made entirely too mechanical. The man who can produce a good tone, and a smooth, brilliant print, has not, by any means, acquired all the knowledge that he is capable f making useful in his vocation. In the printing-oom all temperaments, ages, and peculiarities are too ften treated alike. Each negative is not sufficiently tudied. The most meritorious workman is too generally supposed to be the one who can the soonest ll up a washing-tank.

I am truly glad to see that so much interest is now being taken in the tasteful mounting of photographs. Beautiful designs are constantly being adopted by leading houses, and the day seems to have approached when a stranger, looking over a collection, could dispel from his mind the idea that we all belong to some grand co-operative firm, having for its one grand motive *tasteless uniformity.* We cannot too highly estimate the advantages that the Association[1] seems o have bestowed upon us. Independent of the raternal feeling that friendly intercourse has produced, we have all unconsciously become great gainers, in point of knowledge, by having had the opportunity of pleasantly criticising each other's aults, and studying their merits. I can now but hope hat our improvement may be constant, and that artistic excellence may be the goal for which we shall strive: to reach which, we must use our utmost endeavors.

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[1] The old N. P. A.—ED.

THE BACKGROUND.

BY ALFRED H. WALL.

A TERM sometimes used to indicate the sky an distance of a landscape, but more frequently applie to the space which lies behind a picture's principa object, or objects. How often is the threadbare anecdote to be repeated of the great painter who told th would-be pupil that if he could paint his background he could paint his pictures. No one denies the vita importance of a good background, and yet how few ever treated it in any other than a mechanical and conventional method. As to the photographer, hi sole aim seems to be that it should be free from spots, stains, and comets, and relieve dark hair with light, and light with dark. A few of the simpler principles which should regulate the choice and management of backgrounds may be useful. If you illuminate a sitter—I now refer to portraiture—with a weak light, to secure a powerful effect of light and shade, the lightest portion of the background must be dark enough to give value to the lights of the face, and the darkest portions should not be so dark as to weaken the intensity of the darker shadows, nor so light as to give them a spotty or patchy effect, by rendering them unduly prominent as the darkest parts of the composition. If, on the contrary, you illuminated with a strong diffused light, and obtained a very delicate effect with tender shadows, having powerful eflected lights, a dark heavy background would kill ll the beauty and modelling thus obtained, and render he face a mere flat patch of light. Again, a dry, ard effect will arise from having a background which elieves with equal force every part of the figure. An nlaid appearance destructive of relief will arise from background which exhibits one uniform appearance f texture and a monotonous evenness of tone and olor; an unpleasant effect will arise if the darkest r heaviest portion of a background be at its top nstead of its base, unless the latter be nearly allied o it in tone, etc. The background should serve, in hort, to give force, roundness, and brilliancy to the rincipal portions of your subject, by the judicious ontrast of tone and intensity. White backgrounds, r, in other words, *no* backgrounds exhibit very bad aste. The high lights want brilliancy, because they re no longer the most luminous parts of the picture, uge masses of the same intensity or whiteness killng their force, and effect; the half-tints acquire an ndue amount of force, and so lose softness and elicacy, and the shadows lose transparency. These emarks apply also to those terrible abominations ' white skies," or, rather, *no* skies, in which case not nly do the lights lose their luminous character, the alf-tints their delicacy, and shadows transparency, ut aërial perspective is quite destroyed, and a flat mapike character substituted for that of space and relief. By the proper placing of a model against the darker r lighter portions of the background, the more eautiful outlines may be rendered prominent, and nonotonous, angular, or otherwise objectionable portions lost in a mass of dark. Breadth of effect ma be secured by properly managing the lights and dark of the background, indeed when the portrait is mere bust—or what painters sometimes jocularl call, a cod's head and shoulders—this is frequentl the only method of securing breadth of chiaroscur Do not get a very dark background to contrast white dress, as this would render the latter flat an intensely conspicuous; nor for the same reason plac very dark drapery against a very light backgroun A swarthy model in dark drapery must not have too light, nor a fair delicate complexioned model i light drapery a too dark, background. If you mak use of a painted cloth to represent an interior or out door view, the horizontal line must be at somewher about the height at which your lens is most generall placed, and the vanishing-point nearly opposite th spot occupied by the camera. The lights should be fa removed from white. The best plan is to prepare th background of drab ground, and lay it in with differen tones of the same or similar color, leaving the groun to represent the high lights. Then every part wil retire, and the figure before it be in proper relief. I this background be painted in distemper, or colors prepared with size, take care not to use the glue or size in excess, as the colors will then crack and peel off.[1] A background of this description should be sketchy, faint, and slightly executed. If too forcibly painted, it will destroy the general effect. I have just said that the horizon of a landscape background and the anishing-point should be opposite the lens. I may erhaps for the sake of such operators as are not cquainted with perspective explain why. The figure nd the background are supposed to be taken at one nd the same time, and the camera has the place of he spectator by whom they are taken. Now suppose ve have a real figure before a real landscape; if I ook up at a figure I obtain one view of it, but if I ook down on it I get another and quite a different iew, and the horizon of the natural landscape behind he figure is always exactly the height of my eye. To prove this you may sit down before a window and nark on the glass the height of the horizon, then rise, nd as you do so you will find the horizon also rises nd is again exactly opposite your eye. A picture, hen, in which the horizontal line of the background epresents the spectator as looking up at the igure from a position near the base line, while the igure itself indicates that the same spectator is at hat identical time standing with his eyes on a level with the figure's breast or chin—such productions re evidently false to art and untrue to Nature. It is ardly necessary perhaps to add that the light which lluminates the sitter should not be in opposition o that by which the landscape is lighted. A igure which receives a strong direct light from some ne comparatively small aperture, giving it the dark and powerful shadows of indoors, should not be placed in the full broad light of the open air in which the shadows are weak and the lights diffused. In painting such a background, too, it is well to concentrate the lighter portions near the centre of the screen; to keep the lights down and avoid stron shadows, to prevent lines from cutting the space int sections, and keep the space about the position the sitter's head clear and free. White and black i contrast are fatal to the proper character of a bac ground, for, as Fresnoy tells us—

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[1] Four ounces of glue to nearly a gallon of water is about the usual proportion.

> " White, when it shines with unstained lustre clear,
> May bear an object back or bring it near;
> *Aided by black it to the front aspires,*
> That aid withdrawn it distantly retires."

White, however, should be kept entirely out your background, in order that the high lights of you subject may be luminous and brilliant, as I hav before said, for, to quote Fresnoy again—

> " Give then each foremost part a touch so bright
> That o'er the rest its domineering light
> May much prevail."

The general fault in the painted screens we se behind photographs arises from introducing too man objects. Simplicity and breadth should always b their main characteristics.

GROUPING AND ARTISTIC EXPRESSION.

BY L. M. DORNBACH, S.B.

The first and most important requirement in takin a photographic picture is a faithful representation o the outlines and characteristics of the original, b which we obtain, at the same time, the most desirabl and harmonious picture, satisfying the eye and also he ideal conception of the mind.

That which is very easy for the painter in the production of agreeable portraits—agreeable in conception, position, surroundings, etc.—becomes almost an nsurmountable obstacle to the photographer, notwithstanding he may be provided with the best nstruments and the most reliable chemicals, individual skill and the most faithful representation of the original; and, to give to the whole a spiritual or lifeike appearance, belongs only to the domain of the best of painters.

The question presents itself, Where lies the source of failure in accomplishing all the requirements which a perfect photograph demands? The answer s an easy one: In the want of artistic or picturesque perception and performance; or, in other words, the difficulty in arranging the subject to be taken so as to present the best possible appearance in the picture. There is some difficulty in giving practical hints, and defining the principles involved, to produce results hat shall possess all the requirements that are possible n every particular case.

Viewed from a purely professional standpoint, all hotographic pictures deprived of, or wanting in, rtistic and picturesque properties, though they may ot receive the most direct appreciation, are not the most admired, even if they are more beautiful than he originals. Concerning the want of delineation in etail, we will present those points which must be bserved in artistic relations.

In grouping we have the following divisions: First the position of a single person; second, the grou ing of a number of persons: and third, the arrang ment of surrounding objects.

The first point—the position of a single person- presents the least difficulty; nor is it essential th the photographer should be acquainted with th character, the disposition, and standing of the perso a circumstance, it is true, that is seldom called int requisition. Still, in order that he may be somewh familiar with the character of his subject, the practic photographer will take advantage of the time an opportunity in preparing to take a picture, to recognize all the salient points of character, by enterin into a conversation upon general or scientific topic

We insist upon this the much more, since it ha been customary to represent all persons alike in thei pictures; a sort of stereotyped attitude—a smal table covered with figured cloth supporting a book But all are not alike in their tastes, and an activ business man, or a mechanic, seems out of place whe taken as a literary man.

According to the result of these conditions, th general harmony of the entire body and the positio to be taken are to be determined. The age of th person whose photograph is to be taken may be considered in this place, and presents very little difficulty The position is of much less importance when n external characteristics—costumes, robes, uniforms etc.—require to be considered.

The first and most important general consideratio is to associate whatever naturally belong together and which are dependent upon the difference found i he human family. When a photographer is called ipon to take a portrait of a single person, in a sitting osition, the best rule to follow is to have the indi- idual place himself in the chair and arrange himself aturally at his pleasure.

The just proportion, viewed from the particular re- ation of all the parts, must be preserved under all ircumstances in the harmony, relief, immediately fter the grace and beauty of composition—which hould never be lost sight of—whether the person is tanding or sitting. We must bear in mind, in this rrangement, that the method which succeeds best in iving a life-like expression in the general harmony orresponding in the position of the arms and hands f portraits, in which life can only be successfully lelineated, the inclination and pose of the head and reast, will be best for the expression of face and yes.

By strictly following these rules we give the person he position of a narrator, observer, thinker, etc., cor- esponding to the mental inclination of the individual, nd consequently every case that presents itself will all into its proper category unless the operator is ery careless, and works without any taste, or is pre- ented by the presence of unavoidable disturbing auses.

But it must be remembered that in the application f these principles an exceptional case may arise here a picture cannot be taken by them, and above ll things a stereotyped order must be avoided—a cir- umstance which enhances the value of every picture hundred-fold.

In the arrangement of the individual parts of th body, the following general rules should be observed

The head must be placed erect, within a perpendicular to the rest of the body, whether observe from before or from the side. If a front view is taken a foreshortening of the forehead, nose, chin, etc takes place, and the look, to which proper direction should always be given, is either squinting—which never a desirable feature, being the most disagreeabl of any—or, in case it is kept slightly sideways, indistinct and lifeless.

For the same reasons the head should not be take partly from behind, since, from the same foreshortening, the expression will be very tame, the eye will b small, and, what is more reprehensible, the portra will show the nostrils too prominently. Besides, th last position gives the picture a very undesirable expression; it does not agree with the character of th person, and has little or no personality, and in ever respect is a poor picture.

Thus again, let the position of the head be perfectl straight, but at the same time without constraint, an as easy and graceful as possible; it must still be kep in view that these are merely pictures of such subject as make up the generality of persons, or, as we migh call it, pictures of every-day people.

But this rule is not applicable to actors, painter artists, speakers, etc., for here different positions mu be called into play; an irregular and inclined positio of the heads of portraits gives them a more characteristic expression, as well as more life and truth.

Still this is a matter of refined judgment and cult ated taste, which a skilful photographer should never e deficient in.

In connection with the position of the upper part f the body, the arrangement of the breast, arms, and ands, in relation to the position of the head and diection of the eyes, is next to be taken into considertion. The arms, hands, and breast must exactly oincide in harmony with the expression which is ntroduced by the position of the head; and it ollows that they must be unconstrained, yet so situted that a proper character is thereby expressed and reserved.

An adjunct, consisting of a small table or stand of ome description, is in most cases a desirable assistnce in giving a finish to the picture. But this will e more fully treated of under a separate head—the urrounding objects of the tableau.

Stiffness, or want of ease, whether relating to the hest, arms, or hands, is under all circumstances to e avoided. The upper part of the body must, above ll things, present a roundness and give an impression f comfortable ease. The chest is first placed in uch a position that the axis of the plane in which he shoulders lie shall not be parallel with the inclintion of the head, which prevents the picture from ppearing broad and disagreeably harsh.

The arms should never present parallel positions n any of their parts, but must either rest free and asy upon the lap, yet not carelessly so, or be placed n a position corresponding to the particular position f the hands, which must be so situated that they ie as near the body as possible, without resting upon the knees, nor be closed so as to make a car cature.

Not unfrequently, at least in portraits of men, it i desirable to conceal one of the hands, or at least i part, by placing them on the breast (concealed b coat or vest), or by passing a finger between two buttons of the clothing, in order that the arm ma have a point of rest.

The next in order will evidently be the arrangement of the lower part of the body: this admits c very little application of any rules, with this prov sion, that the position of the feet must be perfectl natural and easy, and so placed as to ensure rest an security to the upper part of the body.

With a standing posture little is necessary to b done, and particularly in the arrangement of females the excellence of the picture does not depend upo the particular position of the feet further than to obtain security and ease for the body, but is dependen more upon the faultless arrangement of the dress— the prevention of disagreeable folds. If the skir hangs loose on the body, the folds of the dress wil not indicate whether the person was sitting or standing. This, however, cannot be regarded as part o the domain of the photographer, yet it may be th source of poor pictures.

The operator will therefore, as far as practicable see that the folds of dresses are properly arranged and be particular that the position of the whole person, as well as individual parts, is properly represented.

From these outlines we may easily secure all that s desirable in a portrait; ease in posture, relief in utline, and beauty of composition, harmony in all arts, and—what is of the utmost importance in a ood picture—the general impression of natural life nd ease.

* * *

UNDER THE SKYLIGHT.

BY ROLAND VANWEIKE.

I SUPPOSE it is understood that I am to explain natters to you as we go along to-day with a view to iving you some instruction. The morning is fine, nd we have the promise that "Sol" will favor us vith his most cheerful rays. The first thing to be onsidered in working under the skylight is, what kind of a light have we? There is a variety of forms nd styles, and it is difficult, perhaps, to prescribe any particular style as best. A large light can be worked more successfully than a small one for all kinds of work; it is of great advantage in dull weather, and can be arranged with curtains to close as much as you wish at any time. A side and top light combined is the most popular light, and is *the* style for general portrait photography. I believe in using *curtains* on a skylight, so arranged that you can drive the light wherever you want it. Curtains of white or blue may be used of different texture, to soften or exclude the light as the case may require. Every photographer is supposed to possess sufficient ingenuity or constructive ability to arrange those things so as to get his light where he wants it, and to be able to regulate it according to changes that may occur during the day. If he has not he had better get somebody that can do it for him, or else get out of the business Many good lights are spoiled by bad management I don't believe in these clap-trap blinds that many use arranged like the sides of a down-east fisherman's smoke-house, to open and shut. They always obstruct more or less light, become elegant receptacles of dust, and require a good deal of tackle and machinery to operate them. Give me curtains that you can roll up at night and keep clean, or in dull weather when you want all the light you can get. But here comes a sitter, and we will try the practical application of what we have been talking about. A vignette; that's the style of picture I like to make. The face and head are what we want—they are really the person—the rest is merely accessory, and it is gratifying that a somewhat cultivated taste has relieved us, in some measure, from the disagreeable duty of arranging in presentable shape, awkward, uncouth limbs and big boots. Take a seat here. This is about the position for most sittings of this style, just under or a very little back of the edge of the skylight, *i.e.*, the edge or side farthest from the camera. This admits the light well around the sitter and gives roundness and relief to the figure. If you place your subject too far back, the result is a flat picture with the light all in front. As this lady has a fine head and regular features, about a three-quarter view will be most favorable. As her shoulders slope well, we will have a front view of the body and turn the head;

hat's it. As the light is not very strong yet, we only eed to draw that curtain on the shadow side suffiiently to give roundness to the face, and bring the urtains up part way on the side-light ; now bring the ack-ground up pretty close, so that the shadow heek will be cut out sharply against it. That looks ery well. You should learn to *see* the light and hade on the face, and when you have done that, you ill be capable of seeing just how your subject will ook in the picture. The untutored eye does not see ghts and shades on a face any more than on that creen, hence there are many that go it blind, placing eir subjects in a certain spot, getting a focus and aking pictures. As a clock that does not go is *right* wice in twenty-four hours, so there will be certain onditions of the light during the day that may make ood work ; it will be right sometimes. But, the light our servant, and will serve us well if we study it losely and learn to make it do our bidding. Now ave the lady keep her head quite firmly against the est ; direct the eyes here, letting them wink naturlly, and think of anything else than the matter in and, forgetting, if possible, that she is before the amera. Now, ... that will do.

All this must be done quietly. If your sitter is ommunicative it is well enough to converse and eep her attention as much as possible away from hat you are doing ; but do not annoy her, or make ourself appear impertinent. Work coolly without ny bustle or appearance of nervousness ; have no oud calling to "Joe" in the dark-room, "Kate" in e waiting-room, or "Bill" in the printing-room :

nothing that will tend to excite the most delicate lad
or make her feel otherwise than perfectly at hom
and that you understand your business, and ar
master of the situation.

Our experience with this subject will serve us fo
all like sittings during the day, with variations a
cording to circumstances. But all sitters are not lik
this one, and we need a versatility of resources t
deal with all successfully. This man now, with thi
features: we will give a three-quarter view of th
body, and turn his face well to the front; or whe
the profile is good, with a well-formed head, that vie
is perhaps desirable. This thin face will not bea
quite so much shadow. Give a little more light o
the shadow side, and draw that thin curtain directl
above the sitter, so as not to have so strong a top
light, and let the curtains well down on the side-ligh
These directions will also answer for this next subjec
who has heavy projecting brows. Get your direc
light from as low an angle as possible, use a goo
deal of diffused light, and give a good full exposur
For gray or very light hair we will carry the back
ground further back, so as to make it darke
Almost any desired shade of background can be ha
by the distance you place it from the sitter. Thi
man with a bald head requires quite a dark groun
I like bald heads; they are generally good subject
with brains enough to keep them steady.

SHARPNESS VERSUS HARDNESS.

BY G. WHARTON SIMPSON.

Disgusted with hard pictures which were vaunted as sharp, Sir William Newton proposed, for producing certain artistic studies, to turn the lens a little out of focus. In the absence of the softness produced by true gradation, he would prefer the bastard softness produced by blurring the lines of the picture. To the painter, this idea might naturally arise, as suggested by the manipulation of his own art, in which the sharp hard lines of the pencil are "softened" by blending them with the badger-hair "softener." The nature of the tools and of the results in the two arts are, however, essentially different. The perfect gradation of a well-lighted object, as given by a good lens on the ground-glass, is immeasurably softer and more beautiful than the finest picture which can be produced by the pencil; and if that image be faithfully reproduced in the picture, it needs no touch of the badger tool to satisfy the most artistic eye. If it did it is very apparent putting the lens out of focus would not really soften the picture but spoil it. As M. Claudet at the time remarked, "If we push the tube out, the parts before the face will be more confused than they were before; and if on the other hand we push it in, the parts behind will be more confused than they were before. The difference will be incongruous in both cases, either for the nearer or for the more distant parts. The confusion in these parts will be such that the drawing will be false and the outline deficient."

In the discussion Mr. Wall did not propose to get rid of sharpness. He admitted that he had disliked the word, that he had decried it, and had both publicly and privately called it hard names; but when he had now carefully set himself to the inquiry "What is it?" he began to suspect that it was after all an old friend of his, and which in his pictures he would not willingly lose. The true culprit was hardness, but he had so often heard hard pictures praised for sharpness, that he had come to regard the two terms as almost synonymous; and he could not readily bring himself to believe that a large majority of photographers did not entertain similar error, and quoted various photographic authorities in favor of his opinion. Lake Price, for instance, condemns the "parrot-cry of sharpness." But it should be observed here that Lake Price does not condemn sharpness, but the "parrot-cry" regarding it: that is the unintelligent and unappreciative use of the term; and the perpetual lauding of it as a substitute for all other artistic qualities.

That it is possible to sacrifice almost every other artistic quality to something which shall be called sharpness, there can be no doubt. We can recall to our mind at this moment portraits taken with the full aperture of a lens of short focus placed nearly close to the sitter. The huge Cyclopean eye of the lens looks not only at, but over and under and all round every inequality in the texture of the skin. And instead of giving an image such as the human eye would see, it yields a monstrosity, in which the velvety skin is as rugose as the hide of a rhinoceros. And yet the first impression conveyed to many minds is one of amazing sharpness, and the pictures get praised for that quality. We have again seen pictures of essentially opposite character. We have seen landscapes and bird's-eye views of towns in which by the use of the smallest possible of stops, sharpness was distributed over miles of space; flat, hard, adhesive pictures, in which the parts had no separation or relief, the extreme distance being glued fast to the foreground; atmosphere was ignored, and the picture of miles of space presented no relief whatever, the effect being similar to that produced by looking at the scene with one eye, and that through an aperture little larger than a pin-head. Such pictures also have been praised for sharpness. We have also seen pictures without any of these enormities, perfect enough in proportion, but possessing only a few keen microscopically sharp lines of black and white, without the slightest gradation of tone or detail, and these also have been praised for sharpness; we presume in deference to their sharp contrast, if to nothing else. We can understand therefore, that Mr. Wall looking at the matter purely from the standpoint of the artist, should have been ready to decry this quality, which amongst certain photographic critics has often been made to do duty for so much else. We have heard an ill-natured remark, to the effect that when a young lady is described as being amiable, it is a sure sign that she is neither clever nor beautiful. Following the same idea, it has been too common a criterion o the absence of artistic qualities when a picture has been praised for sharpness.

It would be as absurd, however, to regard sharpness as a bad quality in a picture, as to regard amiability as a disagreeable characteristic in a lady, simply because they, each amongst a certain class of critics, have been made to do duty for other qualities. Mr. Hughes regards sharpness, that is, perfect definition, as one of the primary and most vital essentials of a good photograph. Indeed, in a certain sense we are disposed to regard perfect sharpness as absolutely essential to, if not entirely identical with, perfect softness. Perfect delicacy of gradation is necessary to softness; and entire sharpness, is, to our apprehension, necessary to delicacy of gradation. The sharper or more perfect the definition, the finer the lines or points; and the finer the lines or points the greater the number of them in a given space; and the greater the number of lines or points of varying luminosity, the more perfect the gradation, and, of course, the softness. Take a carpet, or any other textile fabric, as an illustration. The finer the threads the more soft and perfect the gradation in the pattern. Every school girl knows that the finer her canvas and thread, the more delicate become the patterns of her embroidery. Sharpness is, therefore, an absolute necessity of anything like perfection in small pictures.

We are not about to discuss here whether we should adopt the principle of securing microscopic delineations on a mathematical plane and over a limited ield, or whether an inappreciable amount of astigmatism may not be tolerated in order to secure other advantages. We are merely asserting that sharpness s not antagonistic to artistic qualities, but rather essential to their full development. The works of all our best photographers might be adduced in illustration ; but we will content ourselves by referring to two. In portraiture we believe it is universally acknowledged that the vignette heads of Mr. T. R. Williams are unequalled or unsurpassed by the production of any other photographer. Yet it will be at once admitted, on examination, that they are amongst the sharpest as well as the softest specimens of our art. In landscapes, we know of nothing surpassing the pictures of Mr. Mudd: take Coniston Falls, a picture now familiar to many photographers. In it we have gradation after gradation of distance, all perfectly defined; but without in the slightest degree ignoring relief or atmosphere. After the effect of linear perspective, the all-important element in giving true effect to distance in a landscape is atmosphere, by the influence of which light and shade and color all lose their contrast, and details cease to be made out: forms are not, however, altered; they are still defined, however faintly; there is neither distortion nor the blurring of imperfect focus; and when the latter qualities are present in the photograph they are blemishes not beauties. The artistic photographer will always preserve his chief focus, both definition and of light—using "focus" in an artistic sense—for the principal object in his picture, but he will aim at getting due definition everywhere. He will aim at obtaining sharpness; but in the right place, an distributed in its proper relations throughout th picture.

DEPTH OF FOCUS: WHAT IS IT?

BY G. WHARTON SIMPSON.

It is a trite saying, that almost all controversie arise out of the erroneous use, or misconception, o terms. An incidental discussion, which arose at the Photographic Society the other evening, on the subject of what is termed "depth of focus," and which was but the fresh "cropping out" of an old dispute certainly seems to come under that class of controversies.

Mr. Shadbolt declares the phrase an absurdity and the thing an impossibility; and

> "What's impossible cannot be,
> And never, never comes to pass."

Mr. Sutton affirms that the thing does exist, and that without it we could have no presentable picture. He not only affirms that the thing exists, but that there are two distinct forms of it, one of which is legitimate and desirable and the other the result of imperfection and error in the manufacture of lenses; that a bad lens might give depth of focus with full aperture, but that a good one would give depth of focus by using a sufficiently small aperture.

Now when Mr. Shadbolt exclaims that it is utterly impossible to get two objects in different planes in perfect focus at the same time, he simply states what no one, using the word focus in the same absolute sense in which he uses it, can for a moment deny; but tying the word down to a use a little more absolute, we may further affirm that it is impossible to obtain a perfect focus at all. It is clear, then, that we must use the word relatively. Absolute focus being impossible, the question resolves itself into one of sufficient definition. That a lens the most scientifically perfect, giving microscopic definition to obects on a mathematical plane, will give all other objects more or less out of focus, and that in a most unmistakable manner, there can be no doubt; but whether such a lens is, after all, the best for the purpose of a photographer, is open to considerable question.

The word focus having an absolute sense as referring to the circle of least confusion, or the point at which the rays cross, exception may possibly be taken to the term "depth of focus" as it may be said to be referring to the depth of that which, strictly speaking, cannot have depth. It is possible that the word "definition," as having a more relative meanng might, with advantage, be substituted for the word "focus," and the phrase "depth of definition" be used to describe the quality in discussion. The phrase would imply not depth of perfect focus, since that cannot exist, but such amount of definition through a given space as shall be necessary to meet the exigencies of pictorial art.

Mr. Malone rightly remarks that we must look at the question practically, and in relation to the necessities of photography, and these necessities are, nin times out of ten, pictorial effect. Mr. Shadbol thinks he is true to art as well as science when h states that it requires a lens to approximate to th human eye, which can only have objects in on plane in focus at the same time. But the huma eye will in the fraction of a minute adjust itself t every plane of view before it, and produce on th mind the effect of perceiving the whole at once The painter who sits down to paint a landscap would never dream of fixing his eyes in one focu and never alter it during the progress of his picture His object is to get such a picture as the eye sees as i constantly adjusts itself over the landscape before it. It is true he does not attempt to paint every objec with equal perfectness of definition; he does not se every object so, however he may vary the focus o the eye. There is an increasing veil of atmosphere between him and objects at each gradation of distance, which, while it does not alter or even blu forms, prevents them from being "made out" with the minuteness of foreground objects. All the objects he can define perfectly with the eye, he does not necessarily define as perfectly with his picture, because some require to be subordinated. All foreground objects, and especially those intended to concentrate the interest, will be more crisply defined, more vivid in contrast of light and shadow, and more brilliant in color than the rest. Each receding plane of distance, will be less sharply defined, less marked in contrast of chiaroscuro and color, until, in the extreme distance, details and contrasts are almost entirely lost. But this absence of definition is nowhere of the blurred character which is presented by objects entirely out of focus, and is produced by a lens as perfectly corrected as possible, when used without a stop.

There can be no doubt that the exigencies of pictorial art demand the presence to a certain extent of this quality, which has been called depth of focus. A portrait with the eyes sharp, and the nose, ears, and various locks of hair little more than indistinct blurs, is something very hideous; and yet we have seen this where a lens of short focus, defining very accurately objects on a mathematical plane and nothing more, has been used. A landscape with a few objects crisp and well defined, and the rest a mass of indistinctness in which neither form nor texture is indicated, is simply intolerable and worthless. Some depth of definition then is absolutely necessary to pictorial effect. A portrait lens must have sufficient depth to give, with judicious management, all parts of the body with something like satisfactory definition; all parts of the head should, at least, be fairly defined, so that when the focus is on the eyes, the nose and retiring locks of hair may not be perceptibly out. In a landscape much greater depth is necessary, and in view lenses always exists to a greater or less extent, and is also more readily obtainable by other means than in the case of portraiture.

There are several sources from whence this depth of definition may be obtained. It may sometimes be obtained from what is called a bad lens, that is, a lens imperfectly corrected for spherical and chromatic aberrations. If it be thus obtained it may, by rare accident, be in just the desirable ratio for artistic purposes; but it is more frequently at the entire expense of anything like defining power at all, and renders the lens comparatively worthless. In the ordinary view lens a certain amount of depth of definition necessarily does exist, from the simple fact that it is impossible to correct it entirely for spherical aberration, but the aim of the optician is always to correct it as perfectly as he can. Depth can also be obtained in the best corrected lenses by the use o small stops; by their use the rays of light are made in crossing, to form a much more acute angle, so tha definition over a greater depth of space is obtained Depth of definition can always be obtained by retiring sufficiently far from the nearest object to be taken so as to render the distance of all objects beyond as nearly *nil* as possible in relation to the length o focus of the lens.

As regards the last mentioned method it is clearly out of the question to think of adopting it to any extent in portraiture, as it would involve the use in all cases of very long rooms and of lenses of very long focus. And it is also frequently difficult, even in landscape work, to use it largely. The use o stops for the purpose is doubtless very legitimate and often desirable. But even this has its limits, a the use of very small stops not only involves very considerable loss of light, but also materially diminishes the relief and boldness of the picture, giving i a flat and map-like effect; if, moreover, the aperture be reduced too much, we have not only these evils, but actually err on the other side, and obtain definition of nearly equal distinctness in foreground objects, and those perhaps miles away.

The use of bad lenses seems a thing unnecessary to discuss. No workman would willingly use a bad tool; and where this badness arises from incapacity or carelessness on the part of the maker, although it may now and then, just by accident, give a near approximation to desirable results, it cannot be relied on, and must be ignored as out of consideration. But there are good lenses which possess this defining power over a considerable depth, without losing in an appreciable degree the power of giving the best definition to objects more in focus. It is unnecessary to discuss, nor would it profit the majority of photographers to know, whether this quality is the result of over-correction for color or under-correction for spherical aberration, or both; or the result of a judicious antagonism of forces on the part of the skilful optician. But we think it important in the interest of those who, in practising photography, aim at producing pictures which shall possess definition over as great a depth as an artist would give it in his painting, to state that lenses with such defining powers exist. And that if the productions of those opticians who, in manufacturing their lenses, consider the work they are to perform, and who therefore give to a lens intended for such mechanical purposes as copying, a power to define as accurately as possible a mathematical plane and nothing more, but also give to lenses intended for the production of pictures having different planes of distance, sufficient depth of definition to do the work, when judiciously managed, satisfactorily; if, we say, such lenses are to be stigmatized as bad, then we must confess our conviction that art photographers will for many purposes decide to use such "bad" lenses, and, in the interests of art, we can but commend their decision. We may add our conviction, however, that the term "badness" is in such cases entirely a misnomer, and that such lenses can only be expected from the hands of the very best opticians.

THE PORCELAIN PICTURE; HOW TO MAKE IT.

BY GEORGE H. FENNEMORE

I HAVE nothing, perhaps, that is new to offer in the shape of formulæ, my object being more especially to point out some of the reasons why many fail to produce good results with any degree of uniformity.

As the collodio-chloride process is the one principally used, and as it is the one most beset with trouble to the inexperienced, I shall confine myself chiefly to it. With care, however, it may be made to work with great uniformity. I have tried many of the chlorides for the production of chloride of silver in collodion, but can find none that answers so well as lithium. My formula for collodio-chloride is as follows:

Nitrate of Silver	60 grains.
Chloride of Lithium	8 "
Citric Acid	8 "
Plain Collodion	8 ounces.

The general complaint of those who fail in making porcelain pictures is that the collodion will work very well for a day or so, and then become useless. There may be several reasons for this, but the principal trouble is in the mixing. The ingredients are generally dissolved in water, and added to the collodion. Now, unless great care is taken in mixing them in this way, failure will be the result from the start. The reason is, that ether and alcohol dissolve but a very small portion of the nitrate of silver, and when a solution of silver in water is added to the collodion, the excess of ether and alcohol will precipitate a large portion of the silver to the bottom in very fine transparent crystals, which are not visible on account of the creamy appearance of the collodion, and thus we are deprived of the excess of free nitrate of silver, which is absolutely necessary for production of brilliant pictures. Moreover, the result is a rusty-looking, slate-colored print; whereas, had the proper proportion of chloride and free nitrate been combined in solution, the result would have been a vigorous print, of a bright cherry-red color.

Another thing should be borne in mind, that when two solutions are poured together, the *one* having the power to precipitate the contents of the *other*, they should always be poured together very slowly, and with frequent agitation, unless, indeed, we wish to produce a precipitate on the bottom of the vessel in the shortest possible space of time. In making collodion, we want the reverse, *i. e.*, a very fine deposit, and to have it remain suspended in the collodion for the longest time possible. A collodion that allows the chloride of silver to fall to the bottom in any appreciable quantity will never make a first-class picture.

Having given the above explanation of the nature of precipitation for the benefit of those who do not fully understand it, I now proceed to give my method of making the collodio-chloride:

To four ounces of ether and three of alcohol I add forty grains of gun-cotton; dissolve and filter. I have two eight-ounce bottles—the one containing the filtered collodion, the other empty. I now put sixty grains of silver in a small mortar and pulverize it very fine. I then add a few drops of water, not enough to dissolve it, but enough to make it into a white, pasty mass. I now pour in a small portion of the plain collodion, and triturate it with the pestle until saturated, then let it stand for a minute or two, to let the undissolved portion settle to the bottom. Then carefully decant it into the empty bottle, pour more on from the stock bottle, grind, and decant as before, and so on until all is dissolved. In this way I get the silver in perfect solution. So far it can be done in the light. Now, I wash out the mortar, and put in it eight grains of chloride of lithium, eight grains citric acid, and one ounce of alcohol, and dissolve. I now go in the dark-room and add it to the collodion, a drop or two at a time, shaking thoroughly after each addition until all is added.

It is now ready for use. This collodion does not look white, but has a thin, bluish-white look, partially transparent, and without sediment. It will work well to the last drop. The plate should be albumen-ed with fresh albumen, and be perfectly dry before eing used. It should be toned in a very weak oning bath, say one grain of gold to ten ounces of ater, made slightly alkaline.

THE ALBUMEN PROCESS.

By this process very fine pictures may be made, erhaps even better than with collodio-chloride, but it s somewhat more troublesome. Proceed as follows: ake the whites of four fresh eggs and two ounces f water, in which is dissolved eight grains of chloride f strontia, and beat them up together to a stiff froth. hey should be beaten until you can turn the dish pside down without the contents falling out. Set side for several hours to settle. When you wish to se it, filter it through a clean piece of flannel, and oat the plates evenly with albumen. Should it show disposition to flow unevenly, breathe on the plate: his will give it a layer of moisture that will allow it o flow as desired; rear them up in a place free from lust to dry. When you wish to print, sensitize them n the following bath:

Water	8 ounces.
Nitrate of Silver	240 grains.

Dissolve the silver in the water and add three or our drops of glacial acetic acid, then add eight ounces of alcohol. This gives a bath containing sixteen ounces of solution, with fifteen grains of silver to each ounce of solution. The large proportion of alcohol is added to coagulate the albumen, and more particularly to allow the plate to dry evenly and quickly. The plates should be dipped in a vertical bath, the same as for collodion negatives, but the solution should be filtered, and the bath washed out before each lot of plates are sensitized; when dry, they are ready to print. The only trouble to be apprehended in this process is scum and dust-spots on the plate. They can be avoided, as I said above, by albumenizing away from any dust, and having the solution and bath perfectly clean when about to use them. They can be toned in the ordinary bath, but should have a very weak hypo bath, say one ounce of hypo to sixteen of water, to remain from five to ten minutes immersed in it, according to the temperature.

I hope a fair trial will be given the above, and that the little extra trouble it gives to dissolve the silver, in the manner pointed out, will not be objected to.

PLAIN PAPER PRINTING.

THE laudable desire for matt surface prints, and the still further desire for information concerning their production, warrants the following re-hash of the old processes. Beginners will understand that paper for this purpose must be "salted" before it is sensitized or "silvered." An old-timer, in *Wilson's Photographic Magazine*, gives the following for salting plain paper:

Chloride of Ammonium	160 grains.
Water	1 quart.

Have sufficient solution to draw the paper cometely through with one steady sweep, and hang up ith tacks or clothes-pins to dry. To sensitize, float ı same bath as albumen paper, only about half as ng. Don't bother with the old ammonio-nitrate lver solution, or any brushing-on process. There nothing more simple or reliable than the above. ears of practice have never known a failure.

A good formula is as follows:

Salting Solution.

Water	128 ounces.
Chloride of Ammonium	240 grains.
Citrate Soda	10 "

Dissolve the salts in the water, and immerse the ıper in it for a minute. Take out, and hang up to ry.

Silvering Solution.

Water	11 ounces.
Nitrate Silver	1 ounce.

Dissolve the silver in the water, and take 4 ounces om the bulk; precipitate and redissolve it with amıonia, then add to it the remaining 7 ounces. Allow ıe resulting precipitate to subside. It can then be ltered for use.

The Photographic Times recently collated some ointers on plain paper printing from which what ıllows is taken:

The Rev. T. F. Hardwich, as early as 1856, proosed a method which has been retained by some of ıe older photographers, invariably with excellent ıccess. The process is described as follows: Take—

Pure Citric Acid	100 grains.
Chloride Ammonium	100 "
Gelatine (previously swelled in cold water)	10 "
Water	10 "

The gelatine is used to retain the layer of sensitiv salt at the surface of the paper, but it does not affec the tint. Dissolve the citric acid in a small portio of water, and neutralize with carbonate of soda; th quantity (of common washing soda) required for 10 grains of citric acid is 228 grains; add the alkal cautiously, with continual stirring, until the last portions produce no further effervescence, and the immersed litmus paper, previously reddened by th acid, begins to change to blue.

The best paper for this method is the "Papie Saxe," one side of which is to be floated for tw minutes upon this salting bath. Owing to the presence of gelatine it is preferable to heat it slightly Render sensitive upon a neutral solution of nitrate o silver, 50 grains to the ounce of water, allowing thre minutes' contact.

Based upon the presence of citrate of silver in th sensitizer, any variety of warmer tones, almost to positive red, can be obtained with it. This paper is therefore, especially commendable to the use of th artist. Another, an old and orthodox method, originated with John A. Whipple.

A.—Make a solution of 300 grains of chloride o ammonium in one gallon of water, and soak th paper in it for a minute or two, being careful to avoi air-bubbles forming and settling upon the surface Then hang up and dry.

B.—Dissolve one and a half ounce of crystallized itrate of silver in fifteen ounces of soft or distilled water. Divide the solution into three parts; set one f them aside, and add to the two-thirds aqua ammonia fortior till the yellowish-brown precipitate ormed is re-dissolved in an excess of the precipitant, eing careful to add only enough ammonia to render he solution perfectly clear again, and with but a very light odor. To this ammonio-nitrate of silver soluion add the third of the original solution set aside, which will cause a strong turbination of the liquid, ut which will vanish by the addition of a few drops of glacial acetic acid. Then filter.

The salted paper may be floated upon this solution or two or three minutes, or, as preferred by most ractitioners, the solution is spread over the paper astened with pins upon a clean board, either with a uft of clean cotton-wool, or a Buckle's brush.

It has occasionally been said prints made by this method are dull, monotonous, and without brilliancy. Whenever that has occurred it has not been the fault of the method, but the solutions were evidently not properly prepared. Ammonia but slightly in excess will surely make the print dull and gray; acidity in excess produces chalky and harsh prints. If only acid enough to redden litmus paper after twenty seconds' immersion, the best prints and tones may be secured.

We have given the above formula as it was published more than forty years ago. We have substituted nitric acid for glacial acetic acid with signal success.

Toning prints on either of the foregoing pape does not present the slightest difficulties. If we su mit them to separate toning and fixing, the gold bat either with acetate and carbonate of sodium, or wit borax, must be considerably weaker than if intende for albumen prints. We may tone and fix them i the combined bath with equal success.

Positive black tones may be obtained with D Just's platinum solution, viz.:

Water	200 c.cm.
Borax and Bi-tartrate Potassium . .	2 to 3 grammes.
Chloro-platinite of Potassium . .	1 gramme.

sufficiently diluted; or

3 parts Potassium Oxalate Solution . .	1: 3
1 part Chloro-platinite of Potassium .	1 : 16

from two to four parts of water.

With this solution warmer tones are obtained tha with platinum chloride acidified with nitric acid.

SOMETHING ABOUT STEREOGRAPHS.

BY J. LEE KNIGHT.

I CONCEIVE the theory of a stereograph to be that the two pictures which are to finally blend in the stereoscope and appear as one reality to the eye should be taken from the same elevation, but from two points of perspective as far distant as are the two natural

yes apart; that they should be of the same size;
at they should be transposed in mounting, and that
ey should finally both be placed vertical to the
ame horizontal base line. These conditions are all
asily and accurately accomplished as follows:

I have drawn on the ground-glass of my camera
hree pencil lines, horizontal to the base, about an
ch apart; I have also imbedded in one of the side-
ails of the base of my camera, and near the back
nd, a small spirit-vial, or levelling tube (bought at
ny hardware store for ten cents), which is securely
rotected by a piece of sheet-brass let in flush with
he top of the rail, and having a slot an eighth of an
ch wide and two inches long through which to
bserve the air-bubble. These two simple devices
nable me to level up readily and perfectly, by observ-
g that some one of the pencil lines passes through
point common to both images projected on the
round-glass by the two matched lenses, and that
he air-bubble of the spirit-level comes to the centre
arked on the brass guard.

With the camera properly levelled and a negative
aken and varnished I am ready for using the first
imming pattern. Of these I have three, cut from
trips of glass one 3 by 9 inches, another 3½ by 9
ches, and a third one 3 by 5 inches. If I desire
rints for the ordinary width mounts I use the 3 by 9
ch pattern; if of the extra width, the 3½ by 9,
ying it on the varnished side of the negative, and
eing careful that the lower edge is on an exact line
om some given point in one picture to the corre-
ponding point in the other one. Then, with a knife,

I cut through the varnished film on each side of th pattern from one end of the negative to the othe These marks are useful as guides in placing th paper when printing, and the black lines they giv in the print serve also as guides in the final trimmin We sometimes trim the long way before tonin When the prints have been toned and washed, an are ready to be taken from the water, I bunch them faces all one way, press the water well out, and hang u by a clip to drain. They thus remain straight, an are much easier to manage than if hung singly an allowed to curl up. When nearly or quite dry the are made ready for trimming by laying the bunc face downward, and with a soft pencil drawing tw light lines on the back of each, thus ×, crossing eac other near the centre of the print. I then place them one at the time, face up, on a piece of glass, lay o the long pattern of the proper width, bringing th lower edge exactly to the black line given by th scratched line in the foreground of the negative, an with two strokes of a sharp knife trim the print a top and bottom from end to end. If entirely dry the pattern will fill the space between the two blac lines; if somewhat damp, the sky line may project trifle beyond the upper edge of the pattern. In no case can the black lines be of any damage to the print, but, as above shown, are of real value in accurate printing and trimming. After trimming at bottom and top I fold each print double, face outward, by one straight fold across the centre, observing that the edges are even, so that the crease or fold will be exactly perpendicular to the base or lower lge. I then lay on the 3 by 5 pattern crosswise of e doubled print, bringing the right-hand side up as ar the folded edge as possible, and having evened e lower edge, press down firmly, and with one roke of the knife I trim both ends of the print at ice, and with a second stroke I trim off the slightly ojecting folded edge, which cuts the print in two the centre.

Placing the pieces on a pile in regular order, they e ready for mounting, unless it be desired to wet em down, which may readily be done by placing em, one by one, in the corner of a tray, seeing that ey do not spread enough to pass each other, which ould mix them.

In mounting, I paste one piece and place it on the ount, *without rubbing down*, half an inch from the d of the mount, horizontal to and about a quarter an inch from the bottom of the mount, and at that d where the < shaped pencil-mark (which is half the original × made on the whole print) will point tward. This is the guide by which I know the eces are transposed. I then paste the other piece, it on, and bring the two pieces snug up together the centre, neither overlapping each other nor ving any space between, and being quite careful at no jog occurs where the pieces join, but that the ges are even at bottom and top; I then lay on three four thicknesses of white print paper, and rub both wn at once.

If the camera was properly levelled, the pattern iced accurately in lining the negative, and subseently in trimming the print, there is no reason why the finished picture should not readily an perfectly blend in the stereoscope, and effectuall avoid that chief of all annoyances in looking stereographs—distortion from inaccurate mountin A stereograph imperfectly mounted is worthless as stereograph, but I believe these simple directior will enable even the merest tyro to produce view free from this fault, and may possibly furnish som hints that will prove serviceable to the very be of us.

HOW TO MAKE LANTERN SLIDES.

BY R. J. CHUTE.

I PROPOSE to give a simple method by which ver good slides may be produced. The wet copyin process is the best. In the absence of any better a rangement, I take the camera the negative I wish t copy is made in, remove the tube, which is usuall done by taking out the front, put the negative in th holder, glass side down, and either tack it in or pu in a little strip of wood that will reach across top an bottom, fitting sufficiently tight to hold the negativ in place. The holder is put in its place, the do open, and the slide drawn; the camera is now place in front of a white screen, or a sheet of white car board placed at an angle under the skylight, or may be placed against a ground-glass window— white screen in a south window, where it will receiv the sun, gives a very brilliant light. The negative i sition, a camera carrying a quarter or half-size plate ay be used, if it has sufficient length; the distance required will of course depend upon the size of e negative, whether it is to be reduced, enlarged, the same size. If the slide be the same size as the gative, or larger, it will require a longer box than it be a reduction. The distance between the pying camera and negative may be regulated, partly sliding the box holding the negative in or out, as e case may require. Both cameras should be on a vel, and at the proper height to bring the impression the centre of the plate. The impression should be ed on the ground-glass so as to allow the slide to mounted three and one-fourth inches square. The allest stop in the lens should be used; a half-size rtrait tube answers the purpose. If there be any ervening space between the cameras it may be vered with a dark cloth, as a precaution against lections in the negative.

The camera being in position, the next thing is e prepared plate. The glass should be thoroughly ean and as free as possible from bubbles or ratches. Take good portrait collodion, a trifle inner than for portraits, coat and dip a plate in the dinary manner. A bath slightly more acid than regular portrait work, no doubt, insures a clearer sitive, though I have never made any change. hen a bath made good negatives, it made good sitives.

The exposure depends upon the light and the nsity of the negative. It should be sufficient to ve the positive develop freely with a rather weak developer. A developer of from ten to fifteen grai is strong enough.

The development is the nicest point in the proces If it proceeds too fast the plate is over-exposed, an the positive will have a flat, foggy appearanc When the exposure is right the development pr ceeds slowly, giving time to examine its progres and when the detail is nearly all out, not quite, th development must be stopped. It needs watchin carefully, and in the hands of an operator used t developing negatives, is apt to go too far unless th utmost vigilance be used. The developer continue its action after the washing has commenced, so th if the plate be washed when the development seem about right, after washing it will be found to be to much. I fix with cyanide, and after washing we tone with sulphuret of potassium. I have exper enced some difficulty in always getting the sulphur to work well. It is quite reliable, however, when th yellowest and clearest crystals are used. It needs t be dissolved and well settled; not made very strong rather a deep-orange color is about right, and n used less than a day old. The clear part should b decanted into another bottle when wanted for us If in good working condition, it will tone the positiv through the various shades of brown, till finally th film assumes a bluish cast, by reflected light, when is sufficiently toned, and by transmitted light will b of a beautiful, warm sepia.

Toning increases the intensity a little, so tha allowance must be made for it in the previous stage of the process.

After toning, the plates are well washed, dried, rnished with good clean varnish, and mounted er being cut to the proper size.

HINTS FOR LANTERN WORKERS.

BY DIS SOLVER.

In selecting a lantern let all "gim-cracks" be disnsed with. The simpler the construction, the less ble are you to have trouble on the road from eakdowns.

I prefer the wet process for slides, and have many od reasons for it.

As to the Screen.—"Limelight" writes in the *Phographic Record*, the organ of the Manchester Amaur Society, "It is often urged against the ordinary eet screen that it does an injustice to the pictures at are thrown upon it. The stretching of the aterial on all sides tends to open the cloth, and to a nsiderable extent filters the image away, destroyg its brilliancy. There is a great amount of truth this. The ideal screen should retain the whole of e scene on its surface, for every ray of light that ds its way to the back reduces the strength of the cture, and detracts from the general effect. It is ite evident that nothing short of a thoroughly opaque rface will give the best results. The importance of is, to some lanternists a trifling imperfection, is such at a few well-known lecturers, such as Mr. Paul

Lange, refuse to show their slides unless they can b accommodated with something better than bleache cloth, and will take the trouble of providing the own screen rather than put up with the old time-hor ored sheet. Photographers must move on with th times, and our Society is behind. The opaque shee has its difficulties, I admit, but they are not insu mountable. The roller screen is inconvenient fo stowing away because of its length, but it offers th advantage of being quickly erected and taken dow As for its tendency to irregular stretching at th margin, that is but the fault of bad construction."

Now I decidedly oppose the use of an opaqu screen, because so much light is lost by reflectio when such a screen is used. If limelight is use there may be no perceptible "loss," but the opaqu screen fills the house too full of light and robs th slides of their effect. Good "sheeting" makes th best of screens.

Preparing Slides.—We are often asked for a quic and simple method of preparing an illustration—sa a writing or drawing—for the lantern, without the n cessity of having to copy it and make a lantern slid We have given the method before, but for the info mation of recent inquirers we here repeat it. Co thin glass with benzole varnish to which a few drop of India-rubber solution have been added. The fil dries transparent, but it admits of the finest writin being made on it by means of a steel pen and Indi ink. By superposing the coated glass plain side o to an engraving or picture, an accurate copy of th outline may be made in a few minutes. This pla was originally published by the late W. B. Woodbury.

Mr. J. Humphries claims advantages for a new antern plate which has been patented. It is unbreakable and non-burnable, thus being able to stand the fiercest heat produced in any lantern. The support s a prepared mica. Great trouble had been taken to find a way of treating the mica to give it such a surface as would take and retain color, but this he claims has at last been accomplished The specimens he produced were all by a mechanical process, but he expected that they would shortly be on the market, coated with emulsion for ordinary photographic use. The mica was beautifully clear and translucent, of a fine white color, and absolutely free from spots and blemishes.

Slides by the Powder Process.–A clean glass slide plate s coated with a watery solution of gum-arabic, honey, and bichromate of potash. The plate is dried on the top of the dark-room lamp, and immediately exposed to daylight under another transparency. After a variable time, depending on the light—from twenty seconds in direct sunlight to five minutes in the shade —the plate is taken to the dark-room, removed from the frame, and a small quantity of impalpable powder placed upon the surface. A fine, soft, camel's-hair brush is now used to spread the powder over the plate, and in a few minutes it will be observed that the powder begins to adhere to the surface of the plate in an irregular way, in fact it is a picture that is being developed. The explanation of this apparently extraordinary phenomenon is simple enough. The solution of gum-arabic and honey is ordinarily ver much prone to absorb water from the atmospher and become sticky. When the bichromate of potas is added to it and the sun acts upon the mixture, i loses this property of becoming sticky. It follow from this that a plate coated with the mixture an exposed under a transparency loses its adhesiv nature in proportion to the effect of light upon it, s that those parts exposed to the sun take on no powder but remain pure glass, which makes your hig lights; on the contrary, the shadows having bee protected from the light get adhesive when expose to the air, and hold on to the powder when it i brushed over it. Since a transparency must first b produced by some other means, the powder process would seem to be "a round-about road for a near cut." But do not forget that a powder picture is, first, permanent; second, you may develop at one part and leave another soft and hazy; and thirdly, you have absolute control over the color. Having nothing else beside me at the time, I developed the picture with common soot from the chimney, which gives a kind of sepia tint. Plumbago is often used as a developing powder; to my mind it gives an unpleasant color to a transparency. There used to be sold a powder for this process for the production of burnt-in enamel—just the very thing for transparencies. I do not, for a single moment, imagine that anyone would adopt the powder process as a regular method of making lantern slides, but a trial of this beautiful process would well repay the time and trouble spent on it.—J. K. Tullock.

Varnishing Lantern Slides or Transparencies.—*'Amateur Photographe* gives the following formula or a good varnish for transparencies: it may, if ecessary, be diluted to any desired consistency by he addition of more benzine than is called for by the ormula: the varnish is said to be absolutely color-ess, and therefore perfectly transparent. It is used old:

Copal (soft)	1 part.
Benzine	10 parts.

A varnish for negatives may be made thus:

Alcohol (at 95°)	120 parts.
White Gum Lac	20 "
Camphor	3 "
Castor Oil	1 part.

Dissolve, filter, and add

Concentrated Ammonia	2 parts.

This varnish also is used cold, and the negatives re dried at the ordinary temperature, without heat. he advantage of this varnish is the increased trans-arence given to the intense parts of the negative.—*Vilson's Photographic Magazine.*

Mounting Paste for Lantern Slides.—For attaching antern slide bindings to the glass, nothing is better han bichromated paste, which is used for attaching aper to glass in the manufacture of electric instru-nents, and which is a most useful paste for many urposes in damp climates. It is made as follows:

Flour	2 teaspoonfuls.
Water	4 ounces.
Bichromate of Potash	5 grains.

The flour must be rubbed to a smooth paste with the water, then placed in a saucepan over the fire and kept stirred until it boils. Add the bichromate slowly, stirring all the time; then stand to cool.

This paste must be kept in the dark, and used as soon as possible. Soak the paper in it, and attach to the glass, then place in direct sunlight for a day. This sets up a chemical change in the bichromate, and renders the paste insoluble.—*Journal of the Photographic Society of Japan.*

Coloring Lantern Slides.—Mr. J. M. Hopkins, in the *Scientific American*, gives the following information:

"The colors used for this purpose are transparent aniline colors, prepared for coloring photographs. They are labelled brown, blue, violet, flesh, orange, green, and so on. The ordinary aniline dyes may be used instead of the prepared colors, as they are practically the same. The manipulation of the colors is the same as in water-color painting. The film is kept wet continually, from the beginning to the end of the operation, but, after the broad washes of the first warm tint and the final sky color, the water lying on the surface of the film is allowed to dry off, leaving the film still swelled and wet, but without the surface water.

"The prepared colors can rarely be applied to the slide without being reduced with water. Sometimes the best effects are produced by mixing different colors before applying them, while in other cases the effects are secured by separate washes of different colors superposed. Each wash of color sinks into the film, and is not removed by a subsequent wash.

"Although an easel, or support something like a retouching frame, may be useful, the writer prefers to hold the slide in the hand. The wet plate is held in a slightly inclined position in front of a lamp provided with a plain opal or ground-glass shade. The writer prefers artificial light for coloring, as the pictures are to be shown generally by artificial light, which is yellow. If the pictures are designed for projection by sunlight, it is undoubtedly better to color them in daylight.

"The first wash is preferably put on while the slide is held in an inverted position, and while it is still flowing the blue is added for the sky—at first very light, near the horizon, increasing in intensity toward the top of the slide. After this wash is set, and superfluous water has evaporated, the water accumulating along the lower edge of the plate is removed with the fingers, and the slide is turned right side up, when the extreme distance, whether it be mountain or foliage, is covered with a light wash of blue, and this wash is brought well down toward the foreground. If the blue appears cold, it can be toned down by a very light wash of yellow or red. Trees in the middle distance can now be gone over with a light wash of orange, or orange with a little of the flesh color or pink added. When near the foreground, a very light wash of green is applied to the foliage, but the raw green of the color set cannot be used for this; it must be modified by the addition of orange or of brown. If, when applied, the green appears too cold, it may be toned down by a light wash of brown, of orange, or flesh color. It is desirable to produce variety in the foliage.

"Rocks in the distance are washed with blue, and the color is subsequently modified by washes of red or brown. Trunks of distant trees and some rocks may be left nearly the original color of the photograph, but near rocks and tree trunks may be tinted with brown, blue, or warm green, and subsequently modified by washes of green, red, brown, yellow, or orange.

"It is useless to trace the smaller branches of trees and shrubs, and it is rarely necessary to deal with single leaves or blossoms; when this must be done, a jeweller's eyeglass is required, and fine, small brushes are used, great care being taken to keep within the outline of the object being colored. In all this work the artist does well to remember that the coloring is to stand the test of great magnification and strong light."

The Magic Lantern with Vertical Attachment.—Writing in the *Magic Lantern Journal*, Mr. T. Fletcher says:

"The showing of pictures, good or bad, is not the sole object of the lantern, and it is a method of use which must eventually become of secondary importance. Even at the present time an entertainment which is devoted entirely to physical and optical experiments with the lantern will draw a crowd, when a slide showing performance will, under the same conditions, bring together a very meagre audience. Of this I have myself had ample experience. If the double plano-convex condenser is used, the front of the apparatus can be made to swing back, the front half of the condenser removed and put in the vertical arrangement without the necessity for shifting the lime dangerously near the condenser, dispensing also with an extra condenser and the consequent loss of light.

"It is a very easy matter to make any new lantern so that it can be adapted for chemical, physical, and optical experiments; and it is a mistaken policy to begin to construct a lantern in such a manner as to limit its power to picture showing. Let any of the ordinary exhibitors of slides get up an amusing series of experiments with the lantern, and he will at once appreciate the difference in both the number and the interest of his audience.

"With a divided condenser, two mirrors, and a box, a first-rate vertical arrangement can be made, costing very few shillings. With this, writing and sketching on an oiled ground-glass slide, living insects, magnetic experiments, opaque objects—such as botanical specimens—and many other both amusing and interesting effects, can be provided with the greatest ease.

"Anyone who can sketch well with the pencil can create an endless source of amusement, and with this arrangement it is quite as easy to sketch in the lantern as out of it; in fact it is easier, as drawings can be made any side up and turned round. A comic sketch done upside down, and then turned over, acts like a charm, and a live fly enlarged to twelve or eighteen inches long running about and performing his toilet in public, has a charm far greater than the finest slide ever painted.

SECTION III.

[*Written for Photographic Mosaics.*]

PHOTOGRAPHIC EXPEDIENTS IN OUTDOOR WORK.[1]

BY C. ASHLEIGH SNOW,
N. Hatfield, Mass.

AMATEURS value this little Mentor more highly yearly. On many shelves in the East, and also in the western part of our country, I see three, five, sometimes a half-dozen of the MOSAICS. The editor thinks a few notes from my record-book may prove helpful. But first let me say that no amount of dabbling in any pursuit can compensate for the lack of thorough technical training. Books will be of great assistance, but photography is abused by hundreds, because far more is demanded of it than inadequate training in art pursuits and the science of chemistry warrants them in asking. Apply the modern "quick-as-a-wink," "P. D. Q." methods to art occupations for a change. The artist decides to "do" a dozen or sixteen oils or aquarelles after breakfast and before noon. He arranges a dozen easels about the room, regardless of his light, bearing the canvases to preserve the P. D. O. (painting done in oil). Skies are sometimes blue. A tin pan of "sky color" is mixed, and he glides from easel to easel "slapping in the sky color." Again trees and grass are green frequently, and a pot of green is quickly utilized by aid of the can-opener. Each canvas receives its modicum of green. Rocks are "almost allers" brown, and a dish of umber is mixed, and rocks "put in" all round the circle. At this stage he steps back and rubs his hands. All painstaking methods are relegated to the limbo of the past; he has at once leaped abreast with the times. Fortune's wheel shall henceforth turn for him alone. Now he needs some orange or yellow to "go with" his sky and a red boat or a red cow to complement the green, and these are at once deftly "introduced." A few autumnal ferns and clambering vines are quickly added, and presto! here are the pictures nearly ready for the purchaser, and the forenoon only half gone. Now he has paid some attention to harmony of color; the composition of the picture is according to established rules, but the pictures do not sell. He thereupon concludes that art is a poor calling, and forsakes it for the tonsorial or manicure handicraft, where artists are better paid, and thenceforth art has in him a bitter enemy instead of a stanch friend. But, you exclaim, common sense would tell anybody such a course would end in failure, for he neglected the vital essentials for success. Very well, the picture is not overdrawn; if you apply the same methods to photography, what can result but failure? Rush out, buy your ticket for some attractive spot by the seaside or in the country. Reaching the destined haven where the "shooting" is to begin, you "press the button" on one hundred or so films during the afternoon, ship the roll-holder by express to where they "do the rest," and serenely await the receipt of the promised prints, for the tennis-girl, the yachting maiden, or the Coney Island debutante, and which prints fail to arrive. Do you or anyone blame yourselves? Is it not rather poor photography that suffers? Yet what else could be expected? Not long since I saw a fine photograph of a winter landscape, and while I am hard to please, this picture charmed me to such a degree that I eagerly sought the name of the artist. I wrote to him, asking him if he would kindly give me the particulars of the production of his lovely picture—lens, plates, developer, etc. He replied that his outfit and appliances did not amount to much. The lens was a cheap affair, but that he used all the skill of which he was master in exposure and development of the negative. In other words it was a remarkably lovely picture, made with infinite patience and painstaking care. Now could such a result be the outcome of a rush about the region for a day or so, a roll of films unsnarled, and tossed in the wash-basin for development, and thence into the coal-hod for fixation? When a man learns anything thoroughly the study and experience teach him to respect what he learns. Nay! they teach him to delight in his task *for its own sake*, and not for the hope of reward. The happiness of life depends less upon the commercial value of the work we do, than upon the spirit in which we do it. If a man tries to do the humblest work as well as he possibly can he nust be much interested in it. If, however, he thinks nly of the pay for this work and not of its excelence he will soon weary of it.

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[1] See "A Misty Morn" (frontispiece).—ED. MOSAICS.

Ruskin, it is said, had upon the lid of his desk a uge quartz crystal upon which he had caused to be ngraved in deeply indented letters the words "To-lay!" It was a silent monitor to him during all the ears of his active life. I wish that each follower of hotographic pursuits—and by this term I mean rocess-workers, portrait-producers, landscapists, each nd all—would adopt for a motto the words, "Quality, ot quantity." How soon would bad work change to etter, and from better ere long to work of high nerit. Even failure enables the thinking toiler to vin at last; the consequence of loss becomes its ecompense. The end will tell if the unreached ideal e well guarded. This, then, is my plea for much-bused photography. Again I urge the quality alled open-mindedness, for it will help to success even n the highest and most artistic pursuits.

The specialized mind, like the clam in its shell, huts itself so effectually in its own chosen pursuit hat it knows nothing of what lies, mayhap, next door.

There are painters who never read, and there are reat scholars who know nothing of the graphic arts. Must I tell it, there are photographers who boast hat "they have not read a photo work in twenty ears;" their works do follow them, for they can lispose of them in no way. It is surprising with vhat stolid indifference an art can be regarded by nen who practise another intimately related. In aying this I tickle the gallery men under the chin, for one hears them remark frequently when landscap is mentioned, "Oh! that is a branch of no interest t *us*."

With the hope that MOSAICS reaches hand which practise landscape, governed by minds in ful sympathy with Milton when in *L'Allegro* he sings:

> "Straight mine eye hath caught new pleasures
> While the landscape round it measures;
> Russet lawns and fallows gray,
> Where the nibbling flocks do stray;
> Mountains on whose barren breast
> The laboring clouds do often rest."

I give the practical part of my experience wit plates and developers during the past year, whe I was required to furnish a great number of hand camera and view negatives.

Lenses.—One needs for hand-camera a quick wide angle lens. In crowded streets this may be used upo buildings with time exposure, well stopped down fo fine architectural details. The best all-round lens fo tripod work has been, after trial of many, my Gundlac Rapid Rectigraphic, made specially for me by thi company. From personal inspection of the facto I feel sure that every detail is carefully attended t thus securing perfect work. For copying, for cloud for buildings, for landscapes, I rely upon results i using it with perfect confidence.

There should also be a long-focus lens, 25 to 3 inches, preferably a single achromatic for extende views in hilly and mountainous countries.

Don't forget to wipe the lens daily free from dus or moisture, and use only a soft chamois or old silk handkerchief, never the hand, or try to blow off particles. When not in use lay it aside in a box. Never leave it in the camera, as most do.

Plates.—For general use Carbutt's B., sens. 16, give fine results. If the scene contains much action the American Phœnix dry plates of sens. 50 answer every purpose.

When well stopped down these plates give excellent copies indoors, developed carefully as the makers direct.

For hand-camera work, time or shutter, the "Crown" plates made by Cramer are a pleasure to the worker. I do not see how these could be improved. They are thickly coated, carefully cut, uniform in thickness, and very excellently packed. The name "Lightning" is well given.

A favorite and long-tried developer is eikonogen, ½ ounce, as a reducer; sulphite, chemically pure, 1½ ounce, as a preservative; carbonate of potash 1 ounce, and carbonate of soda, 1½ ounce, as alkalies.

Boil the water long. The above chemicals are for 15 ounces of solution. Take 2 ounces of warmish boiled water and place it in a graduate for the sulphite, another for the potash, and a third for the soda. Stir with a glass rod till each is dissolved. In 2 ounces more now dissolve the eiko, every particle. Then mix and filter; bottle in small bottles holding 3 ounces each after adding the residue of water before boiled. Boiling the water expels the air and also destroys much foreign matter frequently present.

The developer will keep colorless much longer i thus bottled and filled to the cork.

In developing, take a three-ounce bottle, pour one third or 1 ounce into 3 ounces of water at 60° to 70 F. In another graduate pour 1 ounce into 2 ounce of water, and in another pour 1 ounce into 1 ounce o water.

The first is for over-timed plates and I slightl over-expose all my plates, and work hand-camera wit slowest possible shutter. Dilute developer will no hurry things, and one will rarely need to use bromid as a retarder. If upon trial for a little in tray No. it hangs back, remove and place in tray No. 2; her it may rapidly darken; if so, instantly remove to tray of clear water, and mix some with bromide, 1 per cent. solution, a few drops. Keep trays Nos. 1 2, and 3 intact for regular work. No. 1 will *star* all flash-lights and shutter exposures. Let ever detail appear, gently rub with finger any tardy spots and remove now and then and lightly breathe upo the plate to hasten the work. Do not flow too grea a quantity of developer over plate. Air should hav access. Frequently pour off and on again from quit a height on tardy portions. Now change to No. tray, where it should lie until the image "sinks in" at this stage.

There should be some of the image visible at bac of plate. With these three baths carefully used sparkling, quick-printing negative should be secured When you know that the plate has not had sufficien light, a preliminary bath, 10 per cent. solution, carbo-nate of potash in equal parts, water, for one minute will help secure detail. If much line work or contrast is wanted, a quinol bath instead of tray No. 3 will secure it.

"*Sozo-Quinol.*"

Quinol	15 grains.
Sulphite	75 "
Water	3 ounces.
Crystals of Carbonate of Soda in Water (2 drachms)	2 grains.
Caustic Soda	10 "

And I add,

Yellow Prussiate of Potash	5 grains.

Dissolve each before mixing. Boil the water. Mix, filter, and use equal parts of solution and water.

A perfectly free solution must be had. If a particle of quinol be left undissolved it will at once discolor. Keep all developer in a box in the dark. Rinse all trays and graduates with a weak solution of water and hydrochloric acid. Simple water will not answer to clean them. Soak in clean water and fix in hypo solution, 1 to 3. When cleared apparently, transfer to a second tray of hypo, 1 to 4 parts, where let it lie ten minutes longer. A plate is not fixed when it *appears so.*

Now to eliminate all hypo immerse in

Shot-gun Clearing Bath.

Chrome Alum	10 grains.
Sulphate of Iron	50 "
Citric Acid	10 "
Water	6 ounces.

Well wash and varnish with gum benzoin or some good water varnish, the borax and shellac formula.

Recipes are numerous for removing silver stains, but I have yet to see a negative freed by any method now in use.

In making a trip get a sportsman's coat, with many pockets outside, inside, backside. Carry hand-camera plate-holders in the pockets, and if not waterproof you should make it so. A strong bag with flap and buckle will carry the lenses. Your coat will take the record and note books.

In making time exposures I place the hand-camera upon the end of the box in which I always convey it. If more elevation is needed any mechanic can easily attach adjustable legs to one end. Folding flaps like an envelope opened out are quickly adjusted and never in one's way.

One needs in the wagon a box of the chemicals, above named, in glass bottles. The graduates, a small alcohol lamp with large coiled wick, and a small teakettle. Trays of papier-maché with ribbed bottoms are best. Often have them coated with black varnish.

A box of paraffine candles is useful. Melted, leaks or cracks in trays can be stopped. A hasty rub about the edge of a plate prevents frilling in warm weather. They give a safe light for changing and developing by. Common shoe-boxes, to be had at every village store, can easily be converted into dark-room lanterns by the use of alternate squares of red, yellow, green, and orange tissue-paper, one pasted over the other, and all made translucent by a bit of butter. A notch cut at intervals in each side, low enough to allow corner of negative to rest upon bottom of box, gives a useful negative-holder. The weight of two or three negative-holders and dark-room light will be but few ounces. Inside the dark-room light sheets of asbestos paper can be glued, so that it will not ignite should the candle bend over.

Go to the druggist and get him to weigh carefully of any cheap, heavy substance a four drachm packet, a two drachm, a one ounce, and one half-ounce. These will give you instantly the quantity of each chemical in developer, and the scales with so many weights need not bother one. Empty plate boxes preserve, with wrappers, to pack negatives for transit. When filled place on edge and protect edges by a strip of corrugated paper.

A V-shaped wooden trough, the exact width of your wagon and 7½ inches across 1 inch from top will wash all your 4 x 5's and 5 x 7's nicely.

When overcast exposures must be made, a developer that will almost raise the dead can be made. Warm the water until of temperature of new milk. To 3 parts water add 1 part eiko, 2 parts carbonate of potash, 5 parts sulphite. If it discolors, instantly pour off and immerse in water 10 ounces, methylated alcohol 2 ounces, and extract every vestige of spent developer.

A. Pringle, the eminent English scientist, uses:

Metol	60 grains.
Metabisulphate of Potash	300 "
Carbonate of Potash	180 "
Water	8 ounces.

If less density is wanted use carbonate of soda. If more density is wanted use more carbonate of potash. No fog need be feared.

It is of the greatest importance to have a numbe of negative-holders so as to admit of *quick drying* else the film becomes damaged. Many workers ar not aware of this.

Exposure.—All know that the sun changes its cours at certain seasons. In July the light is most powerful. After September 21st the time of exposure mus be increased, and the hours at which during the da one may work rapidly shorten. In winter, shutte work is but little possible. In March, April, an May light strengthens. Exposure tables show b figures and graphic representation how these rule apply.

Long-focus lenses are slower than short-focus. Give good exposure in hilly and mountainous regions.

With a light spring wagon, a few chemicals and appliances as sketched, a camerist may traverse the country and make the trip one of rare enjoyment and pecuniarily very profitable. Snap-shots are very eagerly sought by workers in all occupations. Owners of choice animals are ready to order pictures, and baby is never so pretty as when toddling in the breeze, hat off, and dolly in hand.

Very fine pictures, if one is a colorist, can be made by securing a faint albumen print. Tone, fix, and wash this. Color with tapestry dyes as brilliantly as possible. Now secure a film positive, develop with eiko and carbonate of soda. Superimpose and bind passe-partout style, and frame in nickel or silver or aluminum.

[*Written for Photographic Mosaics.*]

ON THE PREPARATION OF THE FERRIC OXALATE REDUCER.

BY J. J. HIGGINS, A.M., M.D.,
New York.

Of the inferiority of all reducers to the potassic-ferric-oxalate it is unnecessary to speak, and yet by no means can it be said, that it is the one in most general use. Indefiniteness in the directions as to making, and the fact that many are unaccustomed to the use of ferrous oxalate as a developer (from which the *green ferric salt* is usually obtained) are undoubtedly chief among the causes contributing thereto. Not only the very highest authorities endorse its great superiority, but everyone fortunate enough to have personally employed it, is outspoken in its praise. It *is* without question the reducer *par excellence*. If a bath of ferrous oxalate developer is allowed to evaporate, a mass of (1) a yellow sandy deposit, insoluble in water; (2) of a reddish granular salt; (3) of more or less beautiful *green crystals*, is found resultant. Now of these three salts, the latter, viz., the green, only has value as a reducing agent, the yellow and red being worthless. By certain chemical treatment, attended with anything but uniform success, this green salt can be obtained separate and isolated in its purity and in considerable quantity. To enable anyone to avoid this trouble (with as before mentioned, even the most careful and identical manipulation giving no certainty of uniformity o result), and again that those not using ferrous oxalate as a developer may likewise have a ready an reliable method for its preparation, is the purpose o this communication.

Here, however, it must be stated, that this *gree ferrous salt has in and by itself no reducing power.* I is soluble in water, but a negative can be immerse in its solution *ad infinitum* and remain unaffected When combined with sodium hyposulphite, the common fixing agent of the photographer, then its powe is manifested as a reducer, and one of very decide energy. No precipitate or deposit, as with many other reducers, is left upon the film. Slowly (in a few minutes, *p. r. n.*) and yet steadily, reduction progresses and its force *seems* to be exerted more upon the heavy or the dense parts needing reduction, than upon the weaker portions of the negative. The operation is carried on in full light, and is not so rapid but that it is under control, and yet far from tedious. A negative after fixing and washing can be at once subjected to its influence. Its power, however, is greater and its action more energetic when applied to one that is dry. An excellent plan is to make a proof from a negative, and then seeing whether as a whole, or only locally in parts, reduction is desirable, to use it on the plate as indicated. After use let the plate be always *well washed* before being set up to dry. If very considerable reduction is necessary, the color of the film will assume a brownish shade; if but slight, the change of hue is scarcely if at all perceptible. So much *in general* as to the erric oxalate reducer. Now, as to a convenient way for making it for one's use and one which, although differing from that employed when manuactured on a large scale, is in every respect reliable, always giving the desired result. In the composition of the ferrous oxalate developer the two salts used are the *neutral oxalate of potash* and the *sulphate of ron*, the ordinary green vitriol of the shops. It is with this composition that the varied deposits before spoken of occur on evaporation. Replace the sulphate of iron with the *sulphate of iron and ammonia*,[1] and the result is different, for a mass of *practically only green crystals* are found present.

For a sufficient quantity to make a pint of reducer, take of neutral oxalate of potash, 375 grains, and dissolve it in 3 ounces of water, contained in a porcelain or glass developing tray, size 5½ x 7½. To this add of sulphate of iron and ammonia, 146 grains, previously dissolved in 1 ounce of water, and having mixed well, set aside in a dark room or closet for a few days, until complete evaporation has taken place. A dry *green* salt will be found left without admixture of either yellow or red, averaging in weight about one ounce.

If the intention is to make up the reducer at once, pour into the tray 8 ounces of water and stir until solution is effected. Then add 8 ounces of a saturated solution of hypo,[2] filter and bottle and keep excluded from the light. It will do its work over and ove again for a very long time, of course weakening b use. After use, therefore, return it to the bottle, r filtering when necessary to remove sediment or dir

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[1] The "proto" or "ferrous," pale and sea-green crystals, not the 'per" or "ferric," darker or violet colored crystals.

[2] Hypo, one pound, water a pint and a half, making two pints of solution.

If the dry salt is wanted for future use, it can b preserved in a glass-stoppered, wide-mouth vial (wrapped in paper to protect it from the influence light) for years.

[*Written for Photographic Mosaics.*]

JUDGING THE DENSITY IN DEVELOPING.

BY R. W. HARRISON,
Selma, Alabama.

IT is beyond doubt true, that an element of wha might be called luck enters into everything mankin does, thereby modifying the comparative quality o his results. This is especially the case in the production of photographs, and particularly so in the dark room work. Frequently the enthusiasm of a beautifu face, a unique pose, or a desire to excel in a particular case, so rouses the intellectual faculties tha judgment is at its best, and the developer is proportioned exactly to suit all the circumstances of light complexion, temperature, and the process by whic it is to be printed, and a perfect negative result. Bu too often this enthusiasm is lacking, and unless judgment is well based on knowledge the result is too ofte disappointing. "It looked so dense when I took i out of the developer and it makes such a poor fla print." Or, "I thought it looked so soft when I stopped development, but it prints so harshly."

There is no question that in determining whether a negative is strong enough or not in development, the actual opacity is not to be considered alone; a vast number of factors enter in to modify the finished result.

To be explicit I will confine myself to the consideration of development with pyro, which is mostly used by the best operators; but much that I have to say is directly applicable to other developers.

The first department of the subject is where the negatives are weaker after fixing than the density at the end of development seemed to indicate. At this point it is appropriate to remark that the red light used for development makes even a fixed negative seem to have greater contrast than daylight shows, and when the thick yellow film of bromide of silver is added, the seeming contrast in an undertimed negative is still more exaggerated, and unless this fact is noted a negative of this sort will always be much thinner than was anticipated. This is notably the case with babies; in ordinary practice they are habitually a little on the undertimed side, and consequently the opacity in development must be increased or else they will "fix out."

The operator's habits and tendencies are liable to modify his view of the correctness of the foregoing. If he is in the habit of using as much pyro as he can, he is liable to disagree with me; but if, like myself, he tries to use as little pyro as will give a good negative and retain softness, he will see the point. And this leads to the broad generalization, that weakness o pyro is accompanied by the negatives "fixing out;" while with strong pyro that effect is not observabl to so great an extent. Nevertheless the tendencie in both cases in the matter of toning are the sam with much or little pyro, only it is much greater whe the latter condition exists.

In the early days of dry plates, I remember tha one maker in his directions stated that the development was complete when the image on the plat darkened so as to show no outline by reflected ligh in the dark-room; this of course is absurd on th face of it, as everybody knows that an overtime plate blackens up long before it is sufficiently dens to make the best result possible; in fact I have see lovely prints result from negatives that had bee developed a considerable time after the image was lost, even when looking through them.

Another dry-plate maker advised to stop development when the image appeared on the back of th plate. This took hold of a larger number than th former fallacy, but it is just as misleading, for no tw plates are coated an equal thickness, and the proportions of pyro, the complexion and contrast of lighting all have a modifying effect on the time at which th image appears on the glass side of the plate; indeed with many brands it never appears on the back at al when properly developed. With such plates as Cramer's, the fact of the high lights darkening o the back of the plate shows that it is thinly coated an that there is no use trying to get any more intensity However, when the image appears on the back, it als hows that the intensity need not be carried so far ecause the film that it is seen through is thinner, hus making the image seem less intense than it really s, and judgment must be modified accordingly.

This leads naturally to the other side of the subject, vhere the negative after fixing is surprisingly intense. n most cases it results from an increase in the proortion of pyro used in the developer, but there are ther causes; given a strong light and full time it is nore liable to occur, as it is also sure to occur, in a ubject having a very fair complexion (with full time), nd when the face is brought off against a dark ground.

In a general way it must be remarked that in the ase of over-timed negatives the opacity must be ery much increased, not for fear of fixing out, so nuch as to obtain contrast; the same applies to some xtent to subjects that are sunburned or of dark omplexion.

But while all the foregoing apply in a general way, peculiar conditions have a modifying influence. The acid fixing bath and large proportions of sulphite, both giving less color in negatives, call for greater opacity at the end of development; while the various makes of plates act somewhat differently, some fixing out more, and some less; but all that I have ever used acting in a general way as I have indicated.

[*Written for Photographic Mosaics.*]

DEVELOPMENT.

BY D. BACHRACH, JR.,
Baltimore, Md.

I DO not know whether anything can be said or development that is not open to the charge of repetition; I confess that I have not read a tithe of the good articles bearing upon it; but the introduction o the gelatine plate has lifted this subject to a point o importance utterly inconceivable in the period of the collodion process. With the latter, given the collodion and silver bath in proper condition, and exposure *somewhere nearly correct*, the development was a mere mechanical operation, absolutely certain to be uniform with every plate that was prepared under the same conditions. And a day's work in those times had a degree of uniformity of quality hardly attainable at the present time with gelatine plates. I am rather rejoiced at this fact, for it makes a requirement of skill and judgment on the part of the operator that partly counterbalances the part not required now in preparing plates for exposure. While formerly the variation of the amount of iron salts or restraining acid made very slight differences in the range of tones in the resultant negatives, the very opposite is the case at present; and in this part of the manipulation, as well as in the artistic requirements, the operator of the present day can impress his individuality on his work as strongly as in the palmy days of the collodion process. I shall give no formulæ in this article, for we have had them *ad nauseum;* and, besides, every operator knows the standard solutions of pyro and alkalies used; and n order to make the illustration simple I will confine myself to that developer exclusively; the application of the principles involved can be used with all. I may as well inform photographers of the smaller towns, who do a limited business, and who do most of the important work themselves, that it will be no advantage to them to copy the methods of the large and successful studios in cities like New York, where often forty to sixty sittings a day are made. On the contrary, they can produce work with a great deal more range and variation of effects by the exercise of individual judgment in each case.

Now here is the usual method followed in developng plates in a large studio. They have, by long experience, accustomed themselves to very exact exposures, every dish of developer renewed for each batch of plates, and the quantities of pyro, alkali, and bromide as exact as possible each time, and, as a ule, the man doing that and finishing the negative o the point of drying, attending to hardly anything lse. The operator who makes the sittings learns to work in with the method of development exactly. n this way, while the artistic skill of the operator hows itself in the work, there is a machine-like exactness and lack of variation in the technical character of the work. Now, while this may be admirable from some points of view, it is far from being the deal that may be reached by the skilful manipulator who executes all the important part of the work himself. For instance, if he uses one part of the standard stock solution of pyro, one part of the stock solution of alkali, and eight parts of water for the average subject in dark draperies, and the normal method o lighting; when the subject is a lady in light drapery and light effects so much in vogue of late, he wil reduce his alkali at least one-half, will add restrainer and add one-half more water, and he will get a result utterly impossible with his normal developer, and a variation in half-tones not possible with the collodion process; though I still contend that the negatives made with the collodion process have not been equalled by the later gelatine plates, meaning, o course, the *good* collodion negatives—not the poor ones.

Now let us suppose the operator has adopted the extreme shadow or "Rembrandtish" effect in lighting his subject. An increase of the normal time with the same formula as in the last case will give him a far finer result than in giving a normal or exact exposure with the full power of the developer as usually mixed. Suppose, on the other hand, from weakness of light or other cause he has reason to fear an under-exposure, then the full quantity of the alkali no restrainer, and doubling the quantity of water, will at least give him all that the plate is capable of yielding under these circumstances. Again, an operator may find that the use of a much larger quantity o bromide restrainer used with the developer, as in the last modification for Rembrandt effects, gives him a finer deposit and more brilliancy in the high lights ie will simply have to increase his exposures to the oint where harshness is avoided to obtain good rinting qualities. An examination of negatives proluced with these various modifications will astonish nyone at the different character of tones produced n the prints. The scale and range from high light o shadow is changed with each modification in a iost marked degree. And here is where the man of kill and brains will excel the other man in the quality f his work almost as much as was sure to be the case n the days of the collodion process. I have necesarily confined myself to the subject of development, ut the principle is applicable in almost every part of ur work. For one who is uncertain of both his time nd light, the sure and safe plan to pursue is to add the ll quantity of water to the pyro, immerse the plate ierein, and add the alkali, a little at a time, and he an be reasonably sure of a good negative. The reult is not, however, the same in character as when ie developer is mixed at the start *for the character f the exposure and subject.* In fact, it will be found iat a modification of developing solutions exercises much larger influence on the character of the results ian many of us have suspected.

[*Written for Photographic Mosaics.*]

A FEW WORDS ON PYRO.

BY JEX BARDWELL,
Detroit, Michigan.

PYRO, good old friend since the advent of collodion! In old collodion days pyro was used for negative work in England long after it had been discarded in America. Iron took its place, yet we still continued to use it for redeveloping and intensifying. When the gelatine plate made its appearance pyro again resumed its place in the fore, and to-day is considered by many to give a superior negative over all. It is true: a good pyro negative is everything that you might desire. Most of the complaints against pyro are staining, yellow negatives and sometimes green fog. The question is, Can these faults be set aside? I think so, and the grand secret is indicated by Mr. John Carbutt in his formula for process plates, *use your pyro dry*. Any of your favorite formulæ for pyro development can be used in this manner with the exercise of a little judgment. By using pyro in this manner I have had no trouble of any kind whatever. I give one example:

Formula for developer (Stanley).

Stock Solution.

No 1.	Pure Water	80 ounces.
	Sulphuric Acid	1 drachm.
	Pyro	1 ounce.
No 2.	Pure Water	80 ounces.
	Carbonate of Soda	6 "
	Sulphite of Soda (Crystals)	6 "

For use, equal parts, I shall recommend thus—

Pure Water	160 ounces.
Carbonate of Soda	6 "
Sulphite of Soda (Crystals)	6 "

For use, take of above, 2 ounces; dry pyro 5 grains, added just as you are going to use it.

The sulphuric acid is omitted because there is no use for it in this case. Any other formula to be used in same manner.

[*Written for Photographic Mosaics.*]

TONING ARISTOTYPE PAPER.

BY LOUIS BRADFISCH,
Bay Ridge, Brooklyn, N. Y.

ARISTOTYPE, or gelatine chloride printing-out paper, becomes more popular from year to year, and will become still more favored, having stood the test of several extremely hot summers. The essential elements of success in working these papers are, absolute cleanliness in the manipulations, careful attention to small details, and patience sufficient to overcome the difficulties inseparable from any new process. The carelessness with which albumen paper is now treated, especially in the after-washings, has done much to prejudice photographers using similar methods with the new papers, and created an impression that they cannot be worked without excessive care, or else that bad emulsions are the cause of failure. Again, many parties have become dissatisfied because they cannot attain the fairest measure of success at the first trial.

Instead of endeavoring to master the manipulation by careful experimental work with a few pieces of paper, they plunge in at a bound, waste a gross or two through sheer carelessness, and then pronounce it "no good." Enough has been written in the journals during the past year regarding the new papers to enable any student of the art to work them satisfactorily. But people do not read—that is, many of them do not, and this fact is evidenced by the prehistoric galleries everywhere met with, and the hundreds of photographers floundering hopelessly in the mire of ignorance, too prejudiced to realize their situation or too proud to learn. With few exceptions the leading photographers are using emulsion papers and adding fresh laurels to their fame. They realize, that through their aid, photography is getting out of the old rut, for these papers mark a broad dividing line between art and "slop work," bringing better prices, increased business, and the added lustre of artistic fame.

Before starting in upon aristotype paper it is a wise precaution to have a general cleaning up in the toning room. Dirty sinks, wornout trays, mud-lined washing-boxes, rusty japan and cracked agate-ware vessels are all mortal foes of any of the new papers, and from these arise nearly all the troubles experienced in working them. Absolute cleanliness is required in the toning room. Many of them are fit subjects for an official board of health visit and a disgrace to the profession. All the conveniences of a gallery usually centre in the developing room, while anything seems good enough for prints. All iron sinks should be coated with asphaltum, lest iron rust, the mortal foe of all papers, should spatter back into the trays. Agate-ware should be discarded, if possible, or if used, every spot of iron visible should be covered with asphaltum. The same inexpensive, yet safe, article can be used upon all old washing boxes; but they must be thoroughly dried before use, or stains will be the result. It is also advisable to rinse all such vessels, before using them, with a strong solution of sal soda to remove any grease or turpentine the asphaltum may contain. Papier-maché trays are preferable to rubber or porcelain, because of their durability and cleanliness.

If the above points are followed, most of the published toning and fixing formulæ for aristotype paper will give satisfactory results, and the best and most permanent results are obtained with separate toning and fixing.

The following formula will yield rich tones from sepia to black.

Gold Bath.

Water	64 ounces.
Saturated Solution of Borax	½ ounce.
Saturated Solution of Acetate Soda.	1 drachm.

Add gold in solution slowly, sufficient to tone. Now test with litmus paper, and add citric acid (in solution) drop by drop, to almost neutralize the bath, keeping same slightly alkaline. In place of the borax or acetate, one may take his favorite soda for toning.

Hardening and Fixing Bath.

Cold Water.	1 gallon.
Hypo	3 ounces.
B. P. Hardener	½ ounce.

[*Written for Photographic Mosaics.*]

INTENSIFICATION AND REDUCTION OF NEGATIVES.

BY D. BACHRACH, JR.,
Baltimore, Md.

ACCORDING to the self-constituted critics of the technique of our profession, there ought to be no necessity for either of the above-named treatments of negatives, for they ought to have all the necessary qualities when they come out of the fixing-bath. All the same, so long as plates vary in behavior in the developer, and by reduction in the fixing-bath, and so long as we have to use ruby or a dim orange light in the dark-room they will not always be just right at that stage. And, according to the same class of critics, no negative that has been subject to after-treatment ought to be as good as those just right after development, and to this dictum I also attach a large interrogation point. It is particularly not true of negatives properly timed, with clear shadows, that were not left in the developer quite long enough, or had not a sufficient amount of pyro used in the developer. Such negatives intensified with the mercury and cyanide of silver method, as hereafter described, have proved, according to my experience, as fine printers as any negatives developed up to the usual density. I consider this method the best of all, being free from stain, and it is worth while giving it again.

The bleaching solution (No. 1) is composed of bichloride of mercury, 120 grains; bromide of potassium, 120 grains; water, 16 ounces; hydrochloric acid, 1 drachm.

No. 2 (cyanide of silver solution), dissolve 120 grains of nitrate of silver in 8 ounces of water, and 120 grains of cyanide of potassium in 8 ounces of water. Gradually add the silver solution to the other until the cloudiness formed on first adding, which disappears on shaking up, remains permanent. Then et settle, and decant. The negative, after bleaching n the No. 1 solution, must be washed, and then covered with the No. 2 until blackened all through, and then washed thoroughly. The amount of inensity is regulated by the length of time the mercury solution is allowed to act. Of course, when horoughly whitened, it has reached the maximum effect.

For negatives overtimed, thin and foggy, a preiminary treatment is necessary of the mixed hypo and ferrid-cyanide solution, universally recommended or reducing, in order to first obtain clear shadows, and then must be well washed before intensifying.

But for reducing too dense negatives I do not use his universally recommended solution, for the very eason that it acts on the weak parts, or shadows, too apidly for the denser parts, and hence is apt to produce harshness. I use an equal proportion of a aturated aqueous solution of bichloride of mercury or the No 1 solution of the intensifier will answer ery well) with a solution of cyanide of potassium of bout the strength used for fixing ferrotype plates.

This mixed solution rapidly attacks the dense parts of a negative, and acts with rather less energy on the weaker parts, and hence the contrasts are rathe lessened, exactly what is required in most cases; but this cannot be done with any other reducer. The plate must be carefully watched during the operation to prevent too great a reduction. I have made a good printing negative of many an apparently hopeless plate. Should the film soften any in hot weathe with this treatment, flowing over a plain solution o sulphate of iron will both harden it and neutralize any remaining trace of the mercury and cyanide salt remaining in the film. As usual, thorough washing is necessary.

[*Written for Photographic Mosaics.*]

NEW PRINTING METHODS.

BY CHAPMAN JONES,

London.

It is impossible to deny that albumen silver is no longer *the* printing process, and that it has not kept pace with the increase of photographic practice during the last few years. This is matter for congratulation, because albumen silver prints are, as they always have been, wholly unreliable. But still, things are not exactly what one would wish from a scientific point of view, because platinum and carbon, which are the only two direct printing processes that yield results of assured permanency, are not the only processes hat are helping to drive albumen paper from the roud position it once held. There are all sorts of ew silver papers being introduced; and photogaphers are not troubling themselves to know hether they are better than the old paper they are ejecting in the most important matter of all, namely, ermanency; but are absorbed with such comparative ivialities as the ease of toning, the glossiness of the urface, and the cost of the paper.

There is only one consideration of much imortance to the serious photographer after permaency, and that is color. Here it must be admitted iat some of the silver processes of recent introducon show to great advantage, but we doubt whether ny of the brown and sepia tints that they yield are npossible in carbon printing. But those who make igmented tissues do not appear to take any interest 1 showing the color-possibilities of this process. Ve have black and red and sepia and brown; but as rule only one tint of each. Some makers supply lue and green and purple, but these might well be ispensed with so far as the best work is concerned. f some warm blacks and a few different shades of rown were introduced, with proper care to use only ie most stable pigments, we believe that many who ow print in silver would turn their attention to arbon.

Platinum printing is perfect for black and warm lacks; for sepia and allied tints it is also good, but ther uncertain. We can hardly hope to get good rowns in platinum, and it therefore appears to us iat it is especially to this color that the makers of arbon tissue should apply themselves.

[*Written for Photographic Mosaics.*]

A NEW BLUE-PRINT PROCESS.

BY R. ED. LIESEGANG,
Dusseldorf, Germany.

In order to obtain a positive heliographic print after a drawing with black lines on a white surface, it was necessary hitherto to use either the ink or the aniline processes. With these processes, as in the case o every other developing method with chromogenes (pigment forming substances), it was, however, difficult to obtain prints with a perfectly white ground.

I have found that the tin salts are behaving just inversely to the light-sensitive compounds of the other metals, they being not reduced by the action of light, but oxidized.

If drawing-paper is soaked with a concentrated aqueous solution of bromide of tin which has been acidified by a few drops of lactic acid, and then exposed under a pen drawing for about fifteen minutes in direct sunlight, a positive print may be developed with various metallic salts. So, for instance, nitrate of silver, if applied in the form of an aqueous solution, will be reduced at the non-exposed portions of the print, whilst it is not reduced at the exposed parts.

But it is not my intention to deal with this developing method with salts of silver and other precious metals, these salts being far too expensive for a lithographic process. The process which I should like to recommend for this purpose is the following:

Directly after removing the paper from the printing-

ame it is placed in a ten per cent. solution of am-
ionium molybdate. A deep blue positive will be
eveloped in this bath before long, its ground being
erfectly white. It is fixed by washing-out the un-
ltered molybdate in water.

The blue color of the print, consisting of molybdate
f molybdenum bioxide, which is fixed on the fibre
y the bromide of tin, is perfectly unalterable by the
ction of light and air.

[*Written for Photographic Mosaics.*]

THE PRESENT IS HERE.

BY J. F. RYDER,
Cleveland.

Not by what a man *has* done, what he *can* do, but
y what he *is doing*, is the proper estimate to put
pon his professional standing for skill. The word
eputation tastes very good in the mouths of those
ho pronounce it as applied to themselves, especially
hose of the old-school type, or more properly the
ld fogy species. It is a comfort and a pride to them,
s well as a damage. A man may not lean back in
is easy chair with thumbs in the armholes of his vest
nd invite the "younger fry to contemplate him as a
onspicuous figure of the past."

It is dangerous to be satisfied. The past is not
ood capital to do business upon. We cannot live
pon the dinners we ate years ago. "The mill will
ot grind with the water that has passed."

The present is here; it is our opportunity and ou friend if we choose to make it so.

The man who sees in the near future, just before him, something better than he is doing to-day, and resolves to accomplish it, has the progressive spirit o the time. To him we look for advancement, and from him we get it.

[*Written for Photographic Mosaics.*]

A SIMPLE COMBINED BATH FOR GELATINO-CHLORIDE PAPERS.

BY JOHN A. TENNANT,
New York.

There will be little information original with the writer in this paper, but that fact cannot interfere with its possible usefulness. I simply want to recall to gelatino-chloride paper workers a combined toning and fixing formula suggested by Prof. W. K. Burton some years ago, but apparently forgotten.

During the past year I have devoted considerable time to experimenting with combined and separate toning and fixing formulæ, taking care to subject my results to the test of continued exposure to light. My experience has led me to two conclusions, suggestive perhaps, but hardly satisfactory.

The first conclusion is that the combined bath is the handiest and most convenient way of manipulating print-out papers. So much trouble is saved when one can immerse the print, direct from the printing frame in the combined bath, tone and fix rapidly n one solution, and quickly wash afterward. The esults obtained with a combined bath, carefully vatched and handled, are in no way inferior to those btained by using separate toning and fixing soluions; but *sometimes* the whites of the prints will not ppear as clear as one would like, and then there is uestion as to the permanency of the prints. By sing the combined baths recommended for *Ilotype* nd *Lithium* papers I have obtained, but only when sing them with their respective papers, results which eft nothing further to be desired. In both cases, nd in *all* cases where a combined bath is used, reat care is necessary to prevent sulphur toning. xcepting with these papers and the prints toned and ixed with Burton's bath, time has made wonderful hanges in my prints, and few are presentable.

My second conclusion is that where permanency s desired in one's prints, and pearly whites without he bleached-out effect so often seen, and soft gradaion of half-tone, it is better to take the necessary ime and trouble to tone and fix in separate baths, vith all the preliminary and afterwashing recomnended for use with separate baths. After such nanipulation the worker can have absolute confidence n his prints.

Despite my conclusions, the combined bath is so opular—and so very easy in manipulation—that I elieve Burton's formula will be found worth the knowng. It was suggested for use with a European paper, iesegang's aristo paper, I think, but in my hands it as worked well with almost all the American geltine papers. I quote Prof. Burton:

"The toning bath is made up as follows:

Hyposulphite of Soda	4 ounces.
Chloride of Gold	6 grains.
Water	1 pint.

"The prints are put direct into this solution dry. They instantly turn yellowish red, but gradually turn to a warm red, and eventually to a brown. If they are removed whilst yet red, the color, on drying will be a splendid purple brown. If they are allowed to get brown, the eventual color will be an engraving black. The purity of the whites is wonderful, and *there is no loss of half-tone unless the process is carried too far.*

"The prints have only to be washed, when they may be dried in any of the usual ways. The use of an alum bath to harden the films is not a necessity, even when the prints are to be dried on glass, as the gelatine is not so much softened that it will adhere. It is probably, however, advisable to use the alum bath for other reasons.

"The use of the combined toning and fixing bath is a great saving of labor. The only thing that can possibly be urged against the method is that there may be danger of sulphur toning, and of consequent damage to the permanency of the prints. I think, however, that there is very little likelihood of this. It is a thing that would not be likely to happen unless the bath were continuously worked, and it is impossible to work continuously in the way that I have described, even if it were wished. I have said that the prints must be put dry into the toning-bath.

The paper is thick, and it soaks up so much of the solution that its quantity is very nearly exhausted, t the same time it has been deprived of the gold to one. I find that about two grains of gold are taken p for each sheet toned.

[*Written for Photographic Mosaics.*]

EFFECT IN ART.

BY XANTHUS SMITH,
Philadelphia.

Effect is the soul of art, outline its truth, and color ts beauty.

By effect painters mean certain contrasts of light nd dark which strike or impress the beholder, rresting the attention somewhat as bright colors o, but in a less degree.

Effect is constantly found in scenes in Nature, ometimes agreeable, but much more frequently the everse, and these effects are copied by artists and hotographers. By being possessed of the genius f art, or by knowledge, must the painter and the hotographer discriminate between those effects which re agreeable and artistic and those which are not greeable and not artistic. The talented painter may eate his effects, but this the photographer cannot o to so great an extent, being in his out-door views most wholly dependent upon what Nature presents him. But as all that pertains to contrasts of light nd dark, and beauty of effect, applies just as much to

No. 1.

Drawn for Mosaics by Xanthus Smith, Philadelphia.

SWANSEA HARBOR.

the photographer as to the painter, since he has nothing to do with outline and color alone, but deals solely with light and dark, he may display all the skill which his natural talent or acquired knowledge has gifted him with in the management of his contrasts.

To derive a simile from the ear, simple unarranged strong contrasts of light and dark may be likened to noise, whilst those subtle arrangements which captivate and impress are like notes of music arranged into melody.

Any object or scene viewed without light and shadow appears dull, tame, insipid, and a transcription of it would be like a matter-of-fact statement of an event, unclothed with the impressiveness which would be given it by the poet or the orator.

As little or nothing can be accomplished by words solely, in the way of elucidating the mysteries of and value of effect in a picture, I have introduced by way of demonstration the accompanying sketches. No. 1 is a copy of a work by J. B. Pyne, the eminent English landscape painter, and No. 2 is a rendering of the same somewhat as we would get it in an ordinary photograph taken under common-place circumstances.

There are hundreds of examples of fine effects amongst the works of the eminent English landscape painters. They were masters of this quality in art. The reason for my choosing this particular example is that the scene is such an exceedingly simple one, an old hulk on a flat shore, with some low distant hills.

While it is not to be supposed or expected that a photographer could attain just what has been attained in the original of these examples, what I wish to emphasize is, first, the great value of a sky in a landscape scene. Get a sky if you can, let it be caught by trick of lens or shutter, or painted in or printed in; and, second, the importance of working when there are cast shadows upon the scene. They give relief and perspective; and choose the moment in their passage when they reveal the best outlines in the view.

These notions will be at variance with the views of many artists and writers on this side of the Atlantic now; but although mere whims of fashion may scoff at and cast aside as out of date many of the broad general rules which should govern in art, works to be lasting, that is, to go from one generation to another and retain their interest and value, must to a very great extent exhibit the result of either genius or knowledge in the artist in perceiving and applying the broad, lasting principles of art.

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[*Written for Photographic Mosaics.*]

THE DEVELOPMENT OF HIGH-GRADE NEGATIVES.

BY E. M. ESTABROOKE,
Elizabeth, N. J.

There is no getting away from the fact that the development of the dry plate (for high-grade work) is the most important process in photography, and calls for the most skill and experience.

He who desires to produce the most artistic and the highest-finished photographs, must have the high-grade negatives to commence with. Such a negative is more easily produced on certain makes of dry plates, but can be made on none without great care and the utmost skill. Consequently the developer is entitled to and must receive the amount of study and experiment that its importance demands.

We are blessed at the present time with a multiplicity of reducing agents from which to compound a developing agent that shall meet all the requirements of the most exacting dark-room.

Our old friend pyro may still be relied on for the highest grade of work—but the dark-room operator has become fastidious, and is no longer willing to proclaim his business through the medium of his finger tips—pyro is an enemy to clean hands and other things, therefore it has been in a great measure superseded by other and more modern agents, among which, in the amido-phenol group, may be found the reducing agent that shall give the most efficient developer with the least objectionable qualities of the whole list.

My attention was first attracted to the superiority of this group by the use of rodinal, a prepared developer, which possessed unusual good qualities, but I considered it too high priced for gallery use; but learning that it was made up of para-amido-phenol, I commenced a series of experiments and eventually succeeded in improving on the original, so that I now for a year or more past have used para-amido-phenol and hydrochinon in equal parts, with lime and sugar, for all developing purposes either of plates or paper, with eminently satisfactory results.

The advantages I have found this developer to possess are: Rapid and vigorous action, economical permanency, freedom from stain.

Its rapid action gives vigorous but no harsh qualities to the plate. Its permanency enables me to develop many plates before its power is exhausted.

It is thoroughly clean, imparting no stain or color to the hands or to the plate, and though through repeated use it may become very much discolored, it is none the less efficient and energetic until exhausted, and it is cleanly to the end.

I have heretofore published my formulæ for compounding this developer, and consider it unnecessary to burden the pages of Mosaics with formulæ at this late day to any competent dark-room operator.

[*Written for Photographic Mosaics.*]

ORTHOCHROMATISM.

BY J. NICOL, PH.D.,
Chicago.

"They must take up the new photo-chromatic work, or get left."

Anxious to contribute something practically useful to the forthcoming Mosaics, it seems to me that I cannot do better than preach a short sermon from the above text—an extract from a letter recently received from Mr. John Carbutt.

The text may, in the good old orthodox way, be treated under three heads: (1) Who are they? (2) What is the new photo-chromatic work? and (3) Why will they, if they do not take it up, "get left"?

First, then, "they" are professional photographers; as a rule, the most conservative of men, while, as they cater to the tastes, and even to the ever-changing fads and fashions of their customers, they should be the most ready to appreciate and take hold of everything that is both good and new.

Secondly, the new photo-chromatic work is the result of a method or process by which the monochromatic photograph is represented in tones in accordance with the luminous rather than, as by the ordinary methods, the actinic effect of light, or rather colors. Of course, this is clear enough to those who know; but as I don't write for them, I must try to make it plainer. By the luminous effects of colors is meant the various comparative degrees of light and dark which they convey to the eye; and by the actinic effect the relative degree in which they act on the sensitive plate or film, and there are few photographers who do not know that they are very different.

In looking at, say, a landscape, especially at this season—the *fall*, in all the colors of the rainbow, we can appreciate the divisions which artists have made of "light, half-light, middle-tint, half-dark, and dark," and readily see that the blues are less luminous or darker than, say, the yellows, and even the reds. But when we come to photograph the scene, actinsm, and not luminosity, comes into play; and as the lues are very much more active than the greens and eds, which constitute the yellows also, the exposure nust be stopped long before they have produced any ffect. The result is that the negative has only prac- ically a scale of three tones—light, half-light, and lark—instead of five, which it should have, the visu- lly dark combinations of blue being represented as nuch lighter than the visually light yellows and reds, vhich appear as darks.

By orthochromatism is meant, then, a method of reparing the plate so as to make it much more sensi- ive to the reds and greens, and consequently to the ellows, and so extending the color or tone scale to he whole five divisions. The method is not yet per- ect, as the blues are still considerably more active han the greens or reds; and so when the highest lass of work is the aim, and especially in the repro- luction of matter in which the blues are pronounced, t is advisable to cut off or absorb the excess by the nterposition of a yellow screen. But even without he color screen, the results on an orthochromatic re so different from those on an ordinary plate wher- ver color plays a part, as on the rosy cheek, the reckled skin, or the various-hued drapery, that othing short of ignorance of its advantages or ulpable disregard of the interests of their patrons, nd of their own as well, can prevent its adoption by rofessional photographers.

Thirdly, he will *get left* who does not adopt it, be- ause his customers, the general public, are becoming aily more and more educated with the appreciation

of the correct and beautiful, and the time is not f
distant when they, or those of them who are willin
to pay for good work, will not accept anything els
and he who either cannot or will not supply it mu
take down his shingle and betake himself to som
occupation for which he is better fitted.

While there are many reasons why the use
orthochromatic plates should become universal, the
is not one why they should not, as their treatme
is in every respect the same as that of ordina
plates, except perhaps that a little more care mu
be exercised in subjecting them to the light of t
dark-room. They are now regularly on the mark
in all the various degrees of sensitiveness and
keeping qualities equal to ordinary plates.

[*Written for Photographic Mosaics.*]

GELATINO-CHLORIDE EMULSION FOR TRAN PARENCIES BY DEVELOPMENT.

BY W. ETHELBERT HENRY,
Toronto, Ont.

THE production of lantern slides has always bee
remunerative to any professional capable of turnin
out results that will give thorough satisfaction to t
lantern operator, as well as a source of much pleasu
to the studious amateur. Most of my readers w
probably be aware that the great desideratum of
first-class slide is a fully detailed image of good bo
and color, yet so delicate in its gradations as to adm

f small print being easily read through the deepest adows when the slide is laid down upon a news- aper. The portions forming the high-lights should e absolutely without fog or stain of any kind—in ct, just as clear as a piece of plain glass that has no ating whatever.

To obtain these results without the use of collo- ion, is often a source of so much trouble to the erage worker that he prefers to decline any occa- onal orders he may receive rather than go to the ouble of attempting work that may not be altogether tisfactory to the customer; hence the work is almost variably sent to professional slide-makers in one or her of the large cities.

There is no reason why this should be, and there e many lecturers who would gladly pay an extra rice to have their work executed at home, and escape considerable delay. Of course, I am aware at commercial lantern plates may be bought—me better than others—but I propose to show my aders how they may make for themselves lantern ates giving the best results possible upon gelatine at cost of about ten cents a dozen.

I will describe the method of working given some ears ago by H. J. Palmer, M.A., which is so very mple as to be equally fitted to the busy professional otographer and the amateur whose daytime is fully ccupied away from home.

The first requirement is a stoneware bottle of oderate capacity (say ten ounces), or, if such an e cannot readily be obtained, a "hock" bottle ruby glass will do equally well. Failing either of these, a makeshift can be made by pasting brow paper over an ordinary beer-bottle, so as to exclu all light.

Before going to bed put into the bottle:

Tap Water	5 ounces.
Common Salt	100 grains.
Hard Gelatine	125 "

and leave them to soak until the morning.

Next morning, before going to business, place t bottle in hot water until the gelatine is dissolve which will not take more than about ten minutes.

Have ready a well-fitting, clean cork; take t bottle into the dark room—or any ordinary fair dark cupboard will do just as well—and add quick silver nitrate (large crystals), 150 grains, cork t bottle as quickly as possible, and shake it steadi until you are satisfied that the silver has all becon incorporated; I recommend a thorough agitati for *at least* fifteen minutes.

[After the silver nitrate has been added, the emu sion must on no account be exposed to actinic ligl or the result will be foggy plates. The washing a coating must all be done in the dark-room, by rul light, an abundance of which may be used wi safety.]

Next cover the cork with a layer of red flannel (a danger signal), and tie it down with as many intr cate knots as possible—this latter precaution w be unnecessary if you have neither hired girl n children likely to investigate the contents in t interest of science.

The next thing is to ask your wife, if you are for- nate enough to possess one, or your landlady if ou are not, to permit the precious bottle to rest near e stove during your absence from home. It must e left just near enough to keep the contents in a fluid ondition, but not near enough to make them hotter an about 100° F.

Also ask the good lady to give the bottle an occa- onal shake. Upon your return in the evening remove e bottle, and, holding it horizontally, turn it slowly eneath a stream of cold water so as to cause the nulsion to set in a thin coating all over the sides of e bottle. When it is quite set, take it into the ark-room, and fill the bottle with cold water, cork it, d allow to stand for half an hour, change the water intervals of half an hour until bed-time—say about x changes in all—and finally fill with water, and t it stand all night. Next night drain the bottle oroughly, and the emulsion will be ready for use as on as you like.

The principal requisites for plate-coating are clean lass plates, as thin and colorless as possible; a strip f glass accurately levelled; a cream-jug, and a dark pboard, or box, in which to dry the plates.

The operation of coating is quite as simple as pre- aring the emulsion. First, place the bottle in hot ater to dissolve the contents; then filter the emul- on through a piece of clean white flannel (pre- ously wrung out in hot water) into the cream jug, hich should be kept hot by standing in hot water. alance a plate on the tips of the fingers, and pour a ool of emulsion on to its centre, and flow it steadily over the entire surface. Drain off the surplus (not to closely) and put the plate on the levelling shelf set. About a drachm of emulsion will coat a pla 3¼ x 4 inches—or proportionately less is require if the English standard of 3¼ x 3¼ be adopted.

The shelf should be long enough to accommoda a dozen plates, and by the time the twelfth is coate the first will be ready for placing on the drying rack The best way to avoid a mistake is to remove the fir and second, then put the thirteenth in the place or ginally occupied by the first, and remove the third in this way there will always be a vacant space be tween the newly-coated plates and those already se

The plates will be quite dry, and ready for use o the following evening, when they should be carefull packed in light-tight boxes.

The process is so exceedingly simple throughou and the resulting transparencies so beautiful, that sincerely hope my readers—some of them at any rate—will try their hand at making this emulsion, o try even *half* the quantity as an experiment.

Any good developer will work with these plates but it must be used weaker than for negatives.

For ordinary black tones, an exposure of about second in contact with a negative one foot from kerosene lamp is ample.

By variations in exposure and developer it is possible to obtain almost any tone desired.

The foregoing amount of emulsion is sufficient to coat about forty-five plates 3¼ x 4, or sixty 3¼ x 3¼ inches.

[*Written for Photographic Mosaics.*]

THE PREVENTION OF SOLARIZATION OF GELATINE BROMIDE PLATES.

BY VICTOR SCHUMANN,
Leipzig.

SOLARIZATION frequently renders the photographing f objects necessarily difficult. With a very energetic ght it may cause even an entire absence of deposit the plate, leaving it glass-clear, as if not exposed all. Such extreme cases cause but little concern to rofessional photographers, perhaps, their experiences this direction being confined generally to a certain atness of the negative, leading to expressionless rints.

It has long been known that an addition of iodide f silver to the bromide of silver counteracts solariza- on. For this reason, and for others which do not ere concern us, I always, for the past thirteen years, nploy a rich addition of iodide of silver in my dry ates; but never have I noticed its beneficial influ- ce upon a light-sensitive bromide of silver film so bviously and plainly as lately, when preparing my ew photographic plates for exposure on the (till ow unknown) light-rays beyond wave-length 1852, . E. I coated plates, which had a thin gelatine ubstratum, with pure bromide of silver, and others ith bromo-iodide of silver, which had been precipi- ted simultaneously in the same solution in presence surplus of bromide of potassium. These plates I laced under a non-transparent cover with triangular and other forms of openings. Before each of thes holes I burned twenty-five mm. of magnesium ribbo —the first in close proximity, the second one-fourt meter, the third one-half meter, and so on, distan Development showed the first effect (in close proximity) to be essentially different from all others whe the plate contained bromide of silver only. Ther was no intense picture of the opening, as in th bromo-iodide plate, but one glass-clear, and surrounded by a dark halo, the light having annihilate the original impression again on the bromide of silver, but not so on the bromo-iodide plate. This tes was repeated, and always with the same result. Eve when continuing the action of the light still longe on the iodized plate, it would retain its intense impression. I have also tried plates on which agar agar was substituted for the gelatine, and found it t favor the solarization of the bromide of silver. Th other openings in the cover which had been photographed with the light further removed all showe no solarization.

This experiment proves the usefulness of iodide o silver in modern dry plates in cases of very powerfu illumination. Even though the gelatine-emulsio plate would not come into play under such abnorma conditions, as in the above case with my new plate we still gain the experience that for it also iodid of silver should be taken into account more than i has been.

[*Written for Photographic Mosaics.*]

RETOUCHING LANDSCAPE NEGATIVES.

BY W. H. JACKSON,

Denver.

THE various ground-glass substitutes now on the iarket are an invaluable aid to the landscape phoographer in modifying the values of the lights and hades in his negatives. Formerly I worked on this ith lead pencil, crayon-powder, or India-ink, as the ork in hand seemed to require—the pencil for sharp ines the crayon-powder for cloud effects, and the ndia-ink, applied with a large brush, for broad even nts, as where the whole sky needed a lighter tint, ie surface of the varnish adapting itself most harioniously to the various mediums. Lately, howver, I have found the air-brush still better adapted this purpose than any of the above. Using liquid ndia-ink, any effect that it is possible to impart is asily and quickly applied, and with such delicate radations that the mark of one's handiwork now bliterates itself. Thus far I have found the Fountain ir-brush well adapted to this work.

After having expended considerable labor in workig up the back of a negative to secure some desired ffect, and which you have got to perfection, it is very nnoying to find after a few days' use that this has ecome scratched or otherwise mutilated, and the ork must be done all over again. Discarded celluoid films, cleaned thoroughly are a most efficient acking. Bound securely with stout paper, the extra iickness imparted by the film is inappreciable, and oes not prevent the negative going into its old place either grooved box or envelope.

SECTION IV.

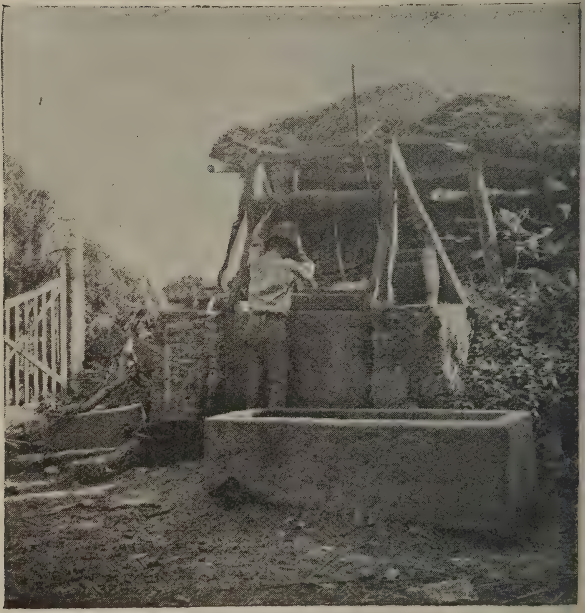
BRITTANY: ILLUSTRATED BY HAND-CAMERA AND LANTERN.

BY A. R. DRESSER.

Two years ago in PHOTOGRAPHIC MOSAICS I gav my views on the hand-camera and its constructio For some time before that I have been contributin various articles to *Wilson's Photographic Magazi* and other periodicals on the manipulation of negatives made with the hand-camera. I now propose t tell how I utilize the products of my camera so as t share the pleasure of my work with others, and t illustrate what I have to say with some of my picture To make the occasion easier for all of us, I propos to shape a sort of lecture, such as I would prepar were I about to give a lantern exhibition to some c our friends at my own house. I have learned b experience that a lantern show is a great deal mor worth while if the pictures are systematically arranged so as to make up a sort of a journey, an each slide accompanied by a little descriptive matte The plan often followed in societies and elsewhere c just projecting the slide and announcing its title i hardly satisfactory, and the good of the exhibition i thus more than half overlooked. Even in a photographic society exhibition the members want mor

han simply a chance to form their own ideas of the
echnical excellences of a picture, of the lens which
aught it, or of the salt with which it was developed.
Iowever my reader may agree with me as to this, I
hall follow the plan I have proposed, and hope to
in him over to my way of thinking. I want to help
im to make his photography show up more for
self than amateur photography is generally made to
o. One of the best things ever done by amateur
ocieties is the maintenance of lantern-slide inter-
hanges. There is no end to the good they are doing,
ut there is a great deal more good they might be
ade to do. In our larger cities, in particular, there
e hospitals, schools, and other organizations where
entlemen and ladies could make the lantern do
lendid work. All that is needed is some business-
ke organization for this work. The reward would
ome from seeing appreciative people enjoy and profit
y the effort, and every once in a while a good word
ight be said for blessed photography. Our amateur
cieties could easily undertake this pleasure-giving
ork if they would. Who will undertake it? Even
the smaller villages there are always schools; then
e various societies are always in need of money.
stitute courses of lectures. Get the ones most in
rested to help sell the tickets; deduct for expenses,
d give them the balance. In this way you will be
ving information to others and creating an interest
our art. And now let us begin.

A little over three years ago Mrs. Dresser and I
ade a hand-camera trip to that "paradise of paint-
s," Brittany.

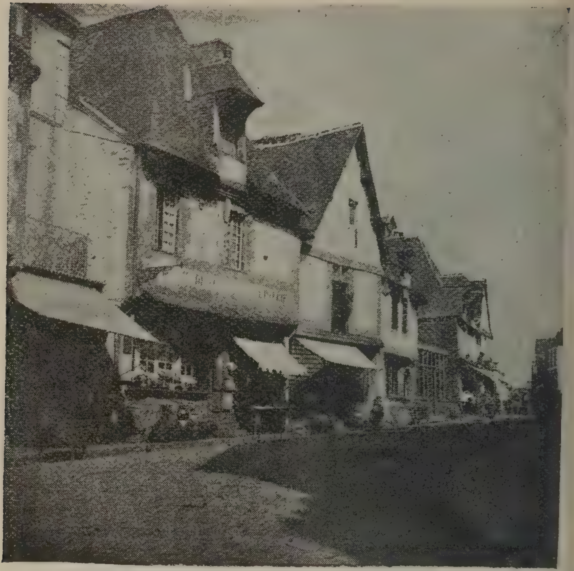


St. Malo. The old well.

As all know, Brittany is one of the most primiti and picturesque regions in the Continent of Europ Therefore, as we found, it supplies a wonderfully fi variety of material for the camera. The "bits" a as plentiful, whichever way one turns, as are the star We enter the land at St. Malo, a pretty place, situat at the mouth of the Rance River, on a granite islan It is a walled town, and at a distance seems to ri right out of the sea. Here queens, kings, duke cardinals, and bishops have all held sway, and histo lies all about, even at the wells and water troughs.

Steamboat landing, St. Servan.

The close proximity to sea and river causes fishing o be one of the great industries of many of the Breton owns. Communication between them is had by steamoat, railway, and by private conveyance. The little ide-wheel steamers which course their way up and own the Rance afford one a fine opportunity for tudying and photographing the curious people and heir more curious costumes. The Bretons are a hardorking, yet a pleasure-loving people. They are "very eligious," too, and make much of their feasts and stivals. They have five virtues and three vices—the irtues being: Love of country, resignation, loyalty, erseverance, and hospitality; and their vices: Avare, contempt of women, and drunkenness.



Old houses at Doll.

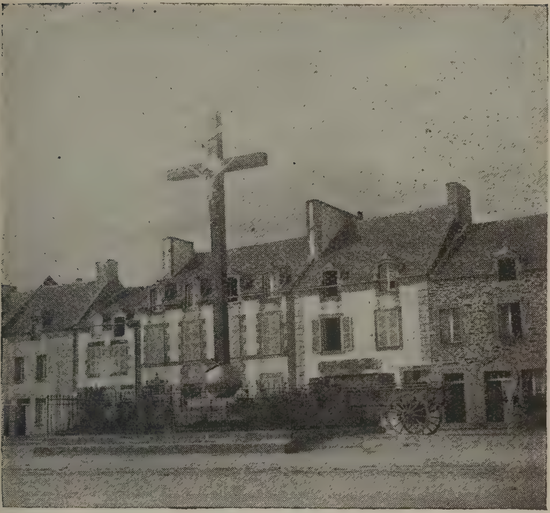
Next to the people their houses and homes are great attraction. Many of them are built, as the French term it, *en colombage*, that is, with the uppe story projecting some fifteen feet over the groun floor, forming a gallery or porch, supported by oak columns or posts, with sculptured capitals. No tw seem to be alike now. A visit among the store offers much to see that is quaint enough, but as they are badly lighted they are no use for the hand-camera. The picture aspirant, therefore, must confine himself to the market-place, to the streets, and to the beach.

Cancale. Oyster women.

One of the chief fishing villages is Cancale. Here ysters largely abound. The dredgers go out to the eds in boats, and bring the oysters ashore, where hey are assorted. The "cullings" are thrown out pon the beach, and then comes in the work of the shwoman. She gathers up the half-grown and imerfect oysters and carries them out to deeper water, here they are left to fatten until some day they again eceive the respects of the oysterman. It has been aid that a disloyal Breton would in former days someimes put acid in his eye to destroy the sight, and hus avoid conscription, but that an oyster was never nown to do anything to escape its fate when its roper plumpness had been attained.

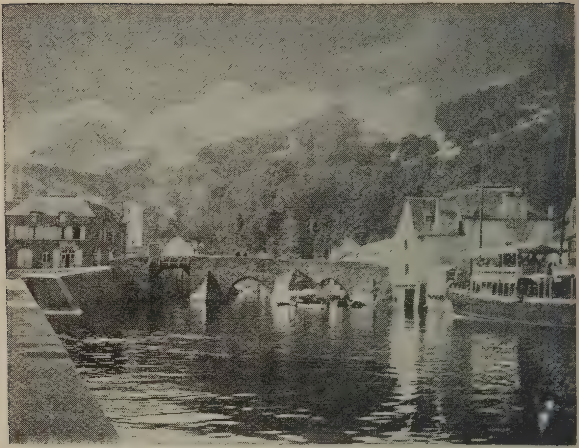
Cancale. Oyster women.

One needs sabots or wooden shoes to walk abou among these industrious women and among the si hundred "parks," as the beds at Cancale are called. On every side the groups of industrious figures remind one of Millet and the "Angelus." Theirs is a serious business, and yet they are always ready with bright repartee when you address them. They are good-natured, kindly, and many of them are fully aware of their value as "models," for the painters who come to Cancale have taught them how to pose. Their work is hard, night and day.



A roadside "Calvary."

In going from place to place one is impressed by the number of crosses to be seen bearing the image of our Saviour. They are not only at the doors of the cathedrals and churches, and here and there in the streets, but along the roadsides, and sometimes n lonely places, hidden by tangled plants. Some of them are costly and are exquisitely carved; others are simple and unpretentious. Some mark the spot where a dark deed transpired, where some fierce passion was revenged; while others are frequented by worshippers who kneel at all times and hours. Many of the roadways in Brittany are dark, lonely, and uninviting. At the entrances to these are "Calvarys" stationed, where the traveller asks protection.



Dinan. The old bridge.

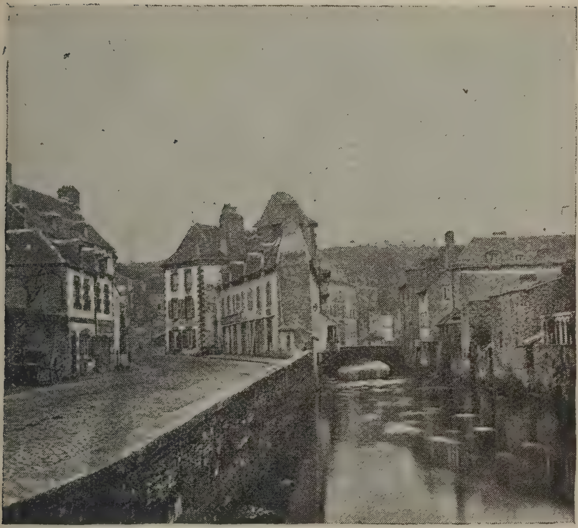
One of the loveliest river rides is from St. Serva to Dinan. The banks of the Rance are varied b rocks, valleys, and verdure. Sometimes the rive widens almost to a lake and then narrows again wit great forests on either side. After passing the cana and some rocky crags, the lovely town is seen wit the old bridge crossing the stream, and where, as yo see, our boat comes to her wharfage. Perched upo the rocks hanging over the town is an old feudal castle with its rough walls. Many a romantic page of history was enacted at Dinan in the fourteenth century The castle is now a prison. It was once occupied b the Queen, Duchess Anne, when on her way to pilgrimage in fulfilment of a vow made during th illness of Louis XII.

Mont St. Michel.

The appearance of Mont St. Michel from all quar-ers is very imposing. It is a cone of granite rising rom the sea. Above rises the fortress, surmounted y the church; its height is four hundred feet from he top of the water. The mount has been the resi-ence of many English princes. Here Henry I. was lockaded by his brother; Henry II. held his court ere, and when Henry V. overran Normandy St. ichel was the only fort that held out against him. even French kings have visited St. Michel, and here ouis XI. instituted the Order of Knighthood. Polite eggars abound. They are fine models.

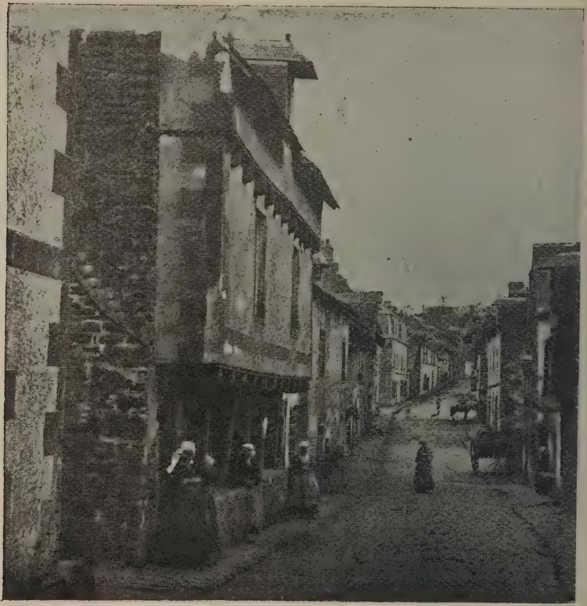
Quimperlé. A town view.

These towns all have their individuality and thei "places to see." No two are alike in interest, an very often the dialect spoken by the people in on district is scarcely understood by those who live bu a few miles away. I found the town of Quimperl one of the most attractive to me, and where ther seemed to be the greatest variety provided for m camera. It is a great resort for fishing, the Quimperlé salmon and trout being renowned throughou Brittany, and even in Paris. It is beautifully situated surrounded by high hills, in a well watered valley.



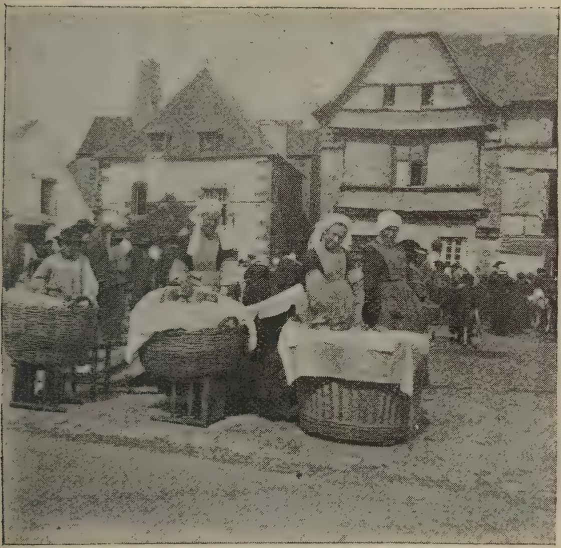
Quimperlé. The lower town.

Quimperlé is divided into two departments—the "upper" and the "lower." This view is of the lower town, through which a portion of the river runs; which river I cannot venture to say, for the department of Finistère, in which Quimperlé is located, is traversed by three hundred streams and has an extent of almost four hundred miles of coast. Parts of Quimperlé, then, are almost as novel to the stranger as are the streets of Venice, and some of the quarters have witnessed just as wily intrigues and as bloody scenes as have the lagoons of the Italian city of the sea. Coins issued at Quimperlé by Edward III. over five hundred years ago are now very valuable.



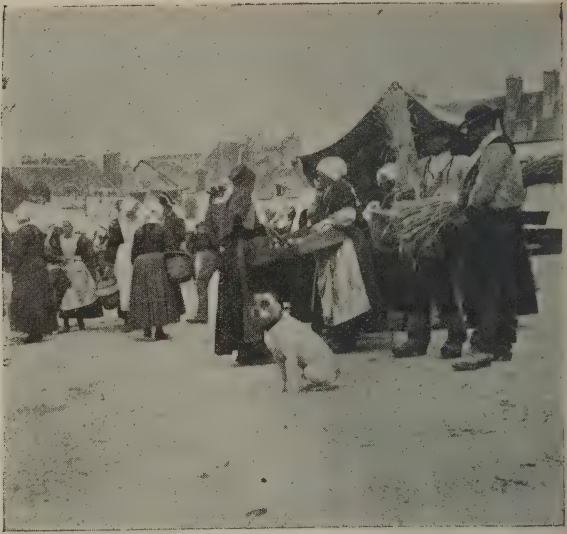
Quimperlé. The upper town.

How different is the view of the streets of the "upper" town, but nonetheless quaint. They are not busy places. No tramway, trolley, or telegraph wires endanger life in them, but a curious, quiet people manage to pull through an existence which is picturesque, and teases one to unbuckle his camera at almost every rod. They seem to rely more upon their history than they do upon industry. After a day's "shooting" there, one's neck and joints become so painful from twisting about as to almost warrant an appeal to the effigy of St. Urlose, which "cures all complaints, especially gout."



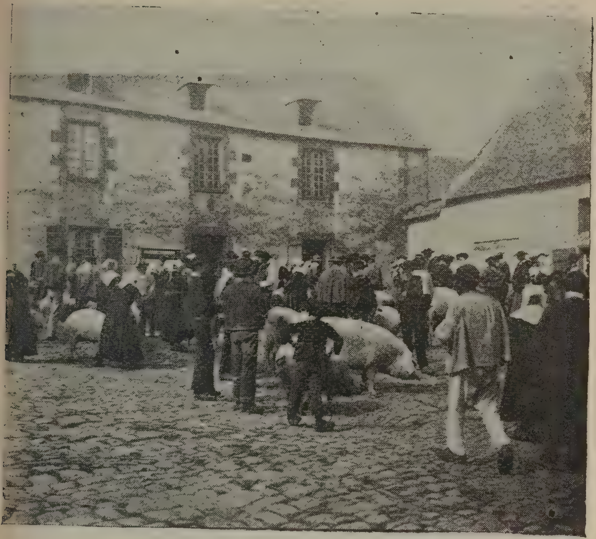
Quimperlé. The market.

The liveliest studies of the Breton peasantry are to
e found in the markets. No roll of Eastman film
as ever made of sufficient length to take in all the
cenes which present themselves here in an hour.
o Euryscope could angle wide enough to catch all.
he vegetable women attract us first. With their
reat willow baskets placed upon the ground or upon
n upset chair before them, the vegetables are ranged
pon neat linen cloths, and the passer-by is plead
ith to purchase. When not thus busied the indus-
ious creatures ply the distaff. They cannot talk
uch English, but can claim their "tip" from the
amera-man.



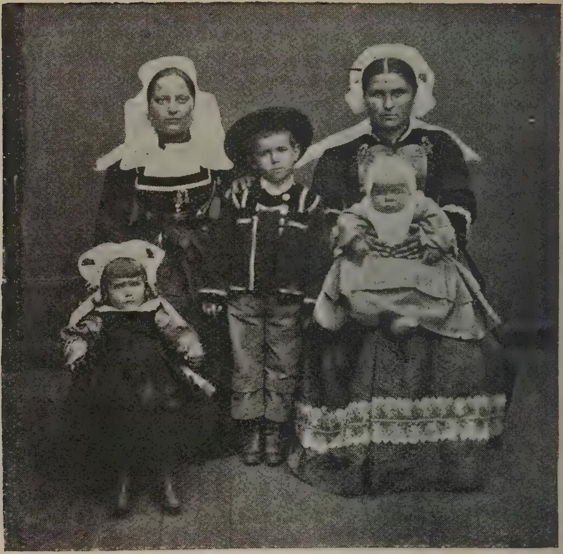
Quimperlé. The fish market.

One of the chief commodities of Quimperlé is sardines. Plenteous as they are, the purchase of quantum suf (or quantum sardine) for a single breakfas is never made without a certain amount of dickering The market people have a one-sided thing of it as rule, for is not there the dog always at hand? See ho obtrusively and chancellor-like he has posed himsel in our foreground. It may be that a streak of nobilit runs in his veins (as it doubtless does in the veins o all Bretons), for once upon a time La Tour d'Auvergne the Premier Grenadier of France (who was Breton) had a learned dog, which he educated as soldier. It went through the drill, and wore boots.



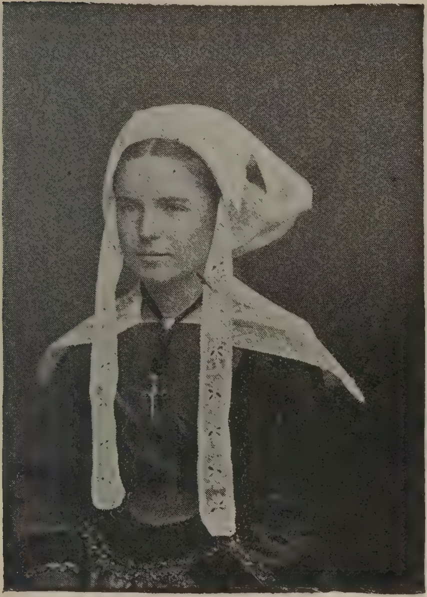
Quimperlé. The pig market.

Of no less importance to the Breton peasant is his
g. He is as tall as a donkey; a lean, long-necked,
gged, bristly, savage-looking beast, as ill-kept as its
ster, and it runs like a greyhound when approached.
ere is always sport at a Breton pig market—and
tures. The pig merchants do well compare with
ir merchandise. Their long, shaggy, uncombed
r hanging round their shoulders (they comb and
sh only on féte days); their dirty canvas bragou-
s, patched coats, and sabots with tufts of straw
mmed in to make them stay on, look more dirty
n it is possible to imagine. Certainly these men
ong to the "lower" quarter of Quimperlé.



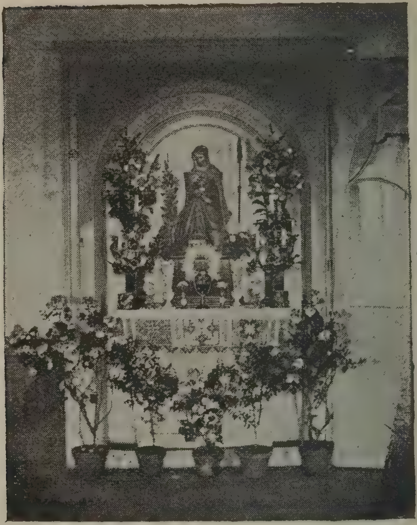
A Breton family.

Let us turn now to the pleasanter side of Breto
life and, consider the customs and costumes of thi
curious people. We leave the father of the famil
out this time, for he has gone out to sea fishing fo
sardines. An engagement with this amiable marke
woman resulted in our group. To my dismay, the
came costumed in their "Sunday best," or féte con
traptions. They speak for themselves—at least fo
their costumes, upon which they set much impor
ance. The Breton woman prides herself more upo
the conformation of her cap than any other part o
her make up, for she often sells her fine hair.



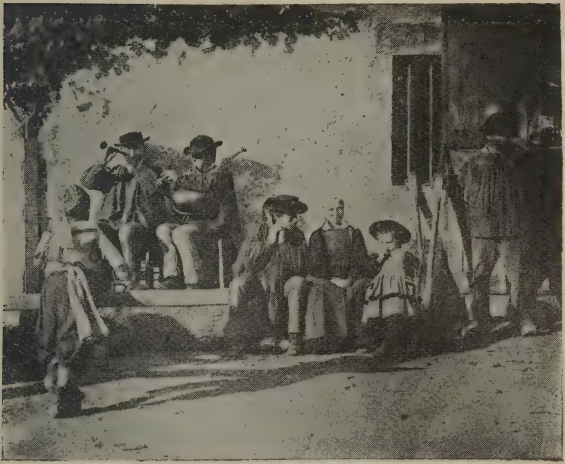
A Quimperlé belle.

Sweet faces are not uncommon among the younger vomen, and they have warm hearts as well. A fine ype appears to us now. Lace and embroidery adorn he cap, and the dress is of violet silk, with velvet rimmings and adornments of beads. The rosary bout the neck with pendant cross tells that our fair ubject is dressed for the "Pardon," an occasion of he greatest importance, and to which we must come resently. The Breton girl prides herself upon her ndurance at the dance. Sometimes she overdoes, nd drops fainting while trying to excel her rivals.



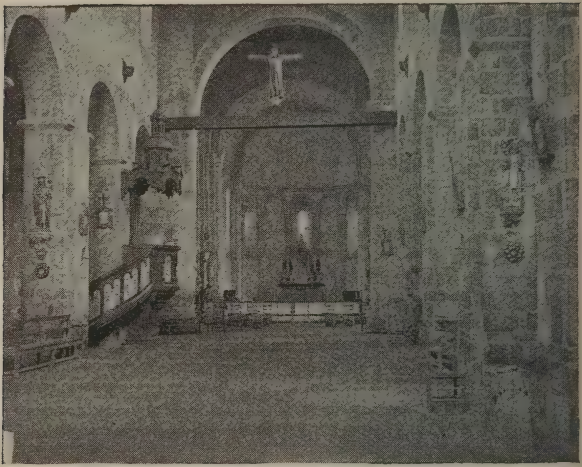
Interior ot the Convent at Quimperlé.

The principal building at Quimperlé is the Church of St. Croix, formerly that of a Benedictine Abbey, celebrated for its riches. The convent being well lighted, presented a chance to secure a picture of the curious altar. The picture of the Madonna is quite a good one. The altar is on the east side of the rotunda, and is approached by three steps. Here, we are told by the legends, St. Gurlot suffered martyrdom. The chains with which it is said he was bound are still hanging against one of the pillars, and his "money box" is in full view. The superstitious peasants attach great virtue to the ashes of their saint, which repose in the crypt below in a sarcophagus.



Musicians at the "Pardon," Quimperlé.

Every church is supposed to be under the protection of a Patron Saint, who continues to work miracles for the faithful, and has the power of procuring pardon for the sinners. On one day at least every year the Saint's relics are displayed with great solemnity; and it is on these occasions that penitents obtain pardon for their sins. Great Pardons generally last three days, and no country circus could draw a more curious and motley crowd. The peasants come from all quarters, and are all dressed in their "holiday best." On the first day the pardoning is attended to; on the second the relics are exhibited; and on the third the happy people, with sins forgiven, give way to dancing and festivity.



Quimper. The old Cathedral.

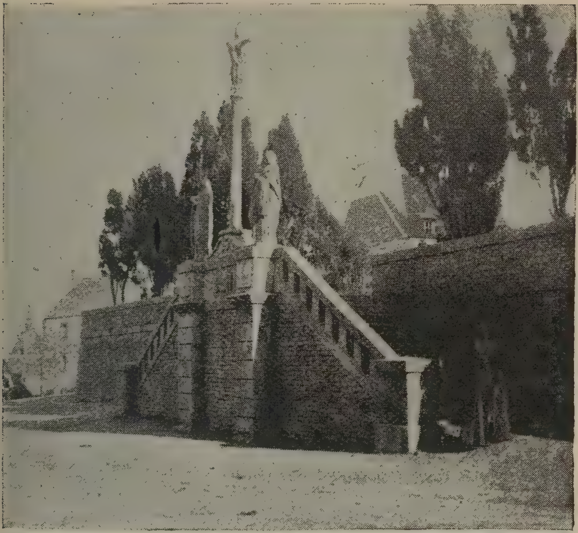
A pleasant drive from Quimperlé takes us to Quimper. The surrounding country is very picturesque and is well watered. A canal runs straight through the town. The cathedral here is one of the most beautiful in Brittany. The high altar blazes with rich decorations. On Sunday, when the nave is crowded with peasants, everyone a living model for camera and brush, the scene is beyond description. The old pictures of Vander-Mælen, animated, with more lace and gayer colors added, would give only a faint idea of it all. The bishop, in his gorgeous robes, surrounded by numerous priests, with grand music, and the noble interior, all help to make up a most impressive display. One who witnesses it cannot soon forget. Oh! for plates or films which will catch all.

At the church door, Guimilau.

At Guimilau is another celebrated church. It partly dates from the Renaissance. It has a finely sculptured porch, and contains within carvings of great beauty. The baptismal font is the gem of all. It is surmounted by a canopy supported by eight columns interlaced with vines, grapes, and flowers, with graceful little birds pecking the fruit. On the top of the canopy is a dolphin, and above two figures of Fame, trumpet-mouthed, surmounted by a crown. The Calvary outside of the church (see on the right) is one of the most expensive in Brittany. All the passages in the life of Christ are represented by figures in the curious costumes of the sixteenth century.

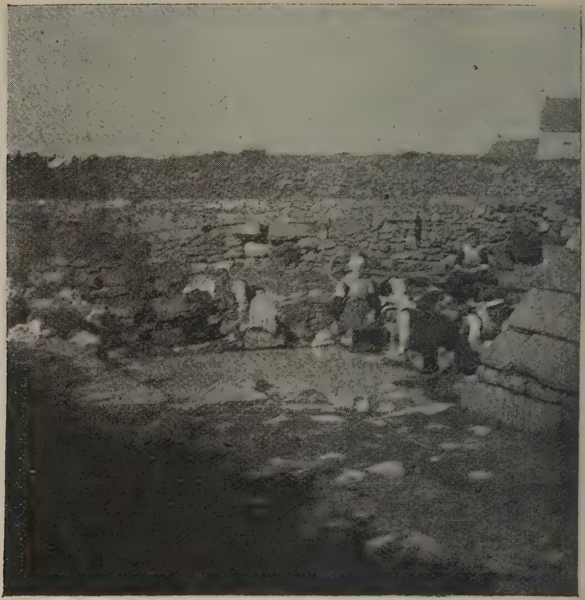
Gossiping at Pontaven.

This scene is at a little village near Quimperle called Pontaven, or the town of the millers. Its citizens are like those of the outside world somewhat, for we see that they are addicted to gossip The town is built upon the rocks at the foot of two mountains, over which are scattered masses of granite boulders, obstructing the course of the river which bounds over them. Mills are established on the ledges of the rocks. These mills, clattering all at once, and the numerous waterfalls, keep up a din which would do justice to a large manufacturing city. Salmon are abundant here, of course. There is a bad bit of gossip about Pontaven, namely, that "there are four millers here to every house."



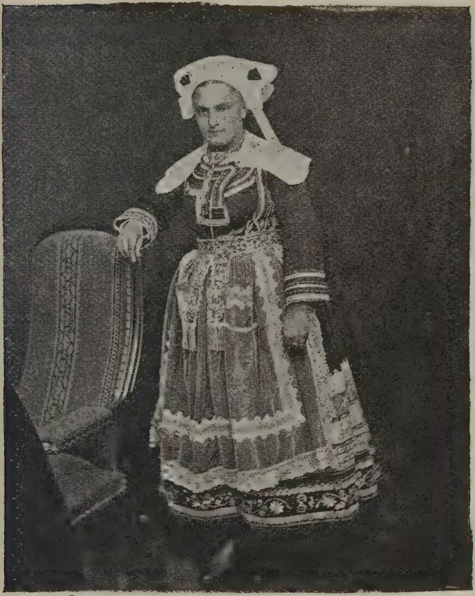
A Calvary at St. Thégonnec.

Less elaborate than some of its kind, yet a very fine example, is the Calvary at the church of St. Thégonnec. The church is an old one, but has been "restored" so often to suit the tastes of the moderns, that it appears rather unpleasantly gaudy. After visiting it, it is a relief to see in the fields near by a scene in real life free from all overdoing and mummery—namely, a lot of peasants with flails threshing buckwheat upon the ground. They thresh in a circle, keeping good time with their strokes, and laughing and chatting merrily as they flourish their flails. Buckwheat is the Breton's chief food. Buckwheat griddle-cakes are called crêpes.



Washing-women at Roscoft.

A well-trained Breton is said to wash himself bu
once a year, but in some districts the women see
to be always washing clothes. We see the first roug
washing going on here in the river. After that th
clothing is placed in a barrel with layers of woo
ashes between. Then boiling water is poured upo
all, and percolating through, carries all the impuritie
down and out at the bung—an improvement upo
the old-fashioned method of "saving" photographi
"wastes." The Roscoff washer-women are as joll
as the threshers, and do not regard their poverty.



A young lady of Scaër.

This is the charmer of them all, and she is dressed n wedding attire. The village to which she belongs —Scaër—is remarkable for preserving old customs, ostumes, and superstitions. Our fair bride has done er best laundry work on the "get up" of her cap, ll pointed and trimmed with lace; she wears a musin apron, also lace-trimmed, and a double muslin hawl is close by, similarly trimmed. The dress is lecorated with bullion and tinsel, and is of bright-iolet colored silk. After the marriage at the church he bride and all present dance the "gavotte."

An old Breton beggar.

The autocrat of Brittany is the beggar; especiall if he has, during a good part of his seniority, served a model to the painters who infest his land. A littl congenial treatment at the café will develop his highest talent. He is a great singer of legends and i often invited to attend at festivals as part of the show He wears the national costume—enormous bragou bras or breeches of a kind of white (once white) sail cloth, a broad-brimmed felt hat, long hair fallin down upon his shoulders, wooden shoes, and a broa belt with metal buckle. Sometimes the jacket an aistcoat are edged with gay colors, and the tailor's ame is embroidered in wool upon the breast with ie date of the making. Although he thus becomes walking advertisement for his tailor, he is autocratic his behavior and serves as a fine representative of ictorial Brittany. No one needs to see more of the ountry after seeing him. He sings of a land made mous by the lives of Chateaubriand, Joan of Arc, ardinal Richelieu, the Edwards, the Henrys, the rthurs, the Louis, the double Queen, Mary Stuart, id many another royal personage. There the Druids ected their menhirs and dolmens and cromlechs, id there Celtic remains yet abound; there Saint ampson, Saint Louis, Saint Michel, Saint Croix, aint Gurlot, and many another one shrived sin-ers whose hands had been steeped in blood, while ikes, duchesses, counts, kings, and dauphins, all pplied material for history and song. Rome, ain, France, England—all have fought in Brittany. er history is as pregnant with interest as her land d water are picturesque, and our beggar can sing of em all.

But there must be an end, even to song and begging. My illustrations have provided but a taste of what gathered. I recommend all my hand-camera friends o can, to go to Brittany. It is as interesting as a orld's Fair and twice as natural.

After we had decided to go to Brittany, and having quired the various ways to get there, we found the st way was to go to St. Malo by steamer from uthampton, and so got all ready for a start. You n go to St. Malo via Cherbourg, and then on by

train, but a steamer from Southampton goes straigh
there; we decided to go that way.

I took my own hand-camera, fitted with an East-
man roller slide and six double-backs. The lens i
the one I have used for years, viz., a wide angl
Voigtlander Euryscope, 4⅛ inches focus, and cover
ing a ¼ plate perfectly at *f*/8, all from 18 feet wid
for distance, and all from 13 feet wide for distance a
f/11. The camera was fitted with my own shutter
that can be worked from one second to two hundredt
of a second with only moving a small pointer on th
outside of the camera; and the setting of the shutter
altering the speed of the shutter, focussing (whe
required for objects under 13 feet), etc., is all don
from the outside of the camera, and it has not to b
opened, except a small door at the side for puttin
in the dark slides. When the roller slide is in use
draw the dark slide and keep it out till I have don
with the roll, as I have a small door that does for
hood to the lens when setting the shutter. I decide
not to take my large camera (8 x 10) on account o
the size, weight, and expense, and trusted to gettin
all the views, etc., I required with my hand-camera
and the result showed that I was right. I did no
take any chemicals with me, as I decided not to de
velop the plates until I returned home. I ran a grea
risk, but I trusted to knowing how to use my hand
camera properly. I bought a "Facile" for Mrs. D
to use, and that was her first attempt at photograph-
ing. I took with me in my box 1½ gross of fas
plates (isochromatic) and 6 (48 exposures) rolls of East-
man's stripping films; a small ruby lamp, so as t

change my plates in my bed-room of an evening, and a screw-driver and gimlet. I kept no record of exposures, but trusted to my developing to know if they were time or instantaneous exposures. And so, takng everything in account, I gave photographing in a strange country a hard trial. I changed every evenng or so in my bed-room, but as I carried when oaded up 60 exposures (my roller slide with 48 and 6 double-backs with 12 plates), I was not obliged to change so often.

I have now demonstrated how the hand-camera, the half-tone process, and the lantern can be made to amuse and instruct the millions at little cost. Great s photography!

THE LAST VENTURE OF THE PHOTOGRAPHER.[1]

A PATHETIC STORY.

As they had the air of a very modest household, and since their funiture only filled a hand-cart, they had to pay the rent in advance. A very moderate rent, for they occupied the sixth floor of a brand new house on one of those great unfinished boulevards, full of signs and rubbish, with vacant lots surrounded by rough board fences. There is an odor of fresh paint in these three small rooms, bright with direct light, which accentuates the more the bareness of the walls. First, here is the studio, with its large skylight, its sombre and cold fireplace, where the coke is all laid, to be lighted only if some one comes. The photographs of the family are hung about the walls. The father, the mother, the three children, sitting, standing, in groups, separate, in all possible poses; and then some buildings, some landscape views flooded with sunlight. These date from the time when they were rich, when the father photographed for amusement. Now reverses have come, and having no calling, he essays to turn his Sunday pastime to account.

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[1] Translated from the French of Alphonse Daudet expressly for PHOTOGRAPHIC MOSAICS.

The camera, around which the children stand in awe-struck admiration, occupies the place of honor in the centre of the studio—its brightly polished brass mountings and shining lens seem to have absorbed all the magnificence and splendor of the poor little room. The rest of the furniture, and so little of it, is old, broken, and moth-eaten. The mother in a plain threadbare black silk, the head covered with a bit of lace; the whole stamped with the air of a shop where customers seldom come. The father, however, has bought himself a fine artist's toque, a velvet jacket with which to impress the *bourgeois*. In this dress, with his broad forehead filled with illusions, and his good-natured eyes, he looks as new as his camera; and how seriously he takes it all. Only hear him say to the children: "Don't go into the dark-room." The dark-room! One might suppose it the den of some python. Inwardly, however, the poor man is troubled. The rent paid, and the wood and coke, he has not a cent left; and if customers do not come, if the frame below at the door does not catch any passer-by, what will the little ones eat to-night? Well, trust in God! everything is completed; nothing more to make ready, nothing to polish; now everything depends on the passers-by.

Minutes of waiting and agony. The father, the mother, the children, every one is on the balcony watching. Amongst so many people there will surely be a customer. But, no; the crowd goes, comes, passes along the sidewalk; no one stops. Yes, surely! There is a gentleman approaching the show case; he examines the portraits, one after another; he seems satisfied; he starts to go up the stairs. The children, all enthusiasm, talk already of lighting the fire. "Wait a little," says the mother, prudently—and didn't she do well! The gentleman goes strolling along. One o'clock, two o'clock; it is growing darker, great clouds pass—nevertheless at the height at which they are first-rate pictures can still be made. But what difference, since no one comes? At every murmur their hopes are raised. False hopes; steps which they hear on the stairs approaching the door, and then brusquely moving away. Once even the bell rang. It was some one looking for the former tenant. The faces lengthen, the eyes fill with tears. It cannot be possible, says the father; some one must have taken down our frame; run down and see, little one. After a moment the child comes up dispirited. The frame is still in its place, but it might as well not be; no one looks at it. Besides, it rains. In fact, the rain is commencing to fall on the skylight with a little spiteful sound. The boulevard is black with umbrellas. The family enter and close the window. The children are cold, but they dare not light the grate which contains the last handful of coke. General consternation. The father paces up and down with hands clenched. The mother hides herself in her room that she may not be seen to weep. Suddenly one of the children, who has taken advantage of a clearing-up spell to step out on the balcony, raps sharply at the window: "Papa, papa, there is some one below looking at our pictures." He was not deceived. It is a lady; moreover, a very good-looking lady. She looks a moment at the photographs, raises the head. Ah! if every pair of eyes turned on her from above possessed a magnet, how she would climb the stairs. At last she decides; she enters, she comes up; here she is. Quickly the match is applied to the fire and the children sent to the adjoining room; and whilst the father adjusts the toque, the mother hastens to open the door, agitated, smiling—the old silk dress rustles slightly.

"Certainly, madame, this is the place." She is received and seated with great cordiality. She is a southerner, somewhat gossipy, but very agreeable; does not care at all for a profile. The first attempt is a failure! Oh, well! we will try again, and without the least ill-humor the southern lady again leans her elbow on the table, her chin in her hand. While the photographer arranges the folds of her dress and her bonnet ribbons, smothered laughter is heard—pushing against the glass door; it is the children elbowing one another that they may see their father putting his head under the green focussing cloth, and resting thus motionless like an apocalyptic beast with a great transparent eye. Oh! when they are grown up they will be photographers—all. At last here is a good negative, still dripping, which the operator brings in triumph. The lady recognizes herself in the black and white image, orders a dozen cards, pays in advance, and goes out enchanted.

She is gone, the door closes; joy unbounded! the released children dance in a circle around the camera. The father, greatly flustered over his first attempt, wipes his brow majestically. Then, as the day is quietly drawing to a close, the mother goes quickly down to purchase a dinner, a dinner a little extra in honor of the occasion; and also—for things must be businesslike—to get a ponderous register with a green eather back, in which are inscribed, in a fine round hand, the day the pictures are to be ready, the name of the lady, and the amount taken in—twenty shillngs! It must be acknowledged that, thanks to the pastry, thanks to the purchase of a little fuel, some ugar and candles, the amount expended just equalled he receipts. But what of that! If they made twenty hillings to-day, the first day, and rainy at that, magine what will be made to-morrow. And the vening passes in building air-castles. It is incredile how many such a suite of three small rooms, ixth story, front, will contain. The next day—uperb weather—nobody; not a customer all day ong. Well, what do you expect? that is the way f business; moreover, there is a little left from the east, and the children do not go to bed with empty tomachs. The day after, still nothing; the watching from the balcony is more eager, but unrewarded. Th southern lady comes for her twelve pictures, and tha is all. This evening to get bread a mattress had t be pawned. Two days, three days pass thus. No the distress is real. The unfortunate photographe has sold his velvet toque and jacket. It only remain for him to sell his camera and go to work somewher as a clerk. The mother despairs; the children eve no longer go to watch from the balcony. All at onc one Saturday morning, when the least expecte some one rings. It is a wedding party, a whole wec ding party, which has climbed the five flights of stai to be photographed. The groom, the bride, the be man, and the maid of honor, good, honest peopl having put on a pair of kids once in their lives, ar anxious to immortalize the memory of it. This da they make seven dollars and a quarter. The ne day twice as much. It is done: the business established!

Behold, one of the thousand dramas of Paris life— one of the *comedies* of photography.

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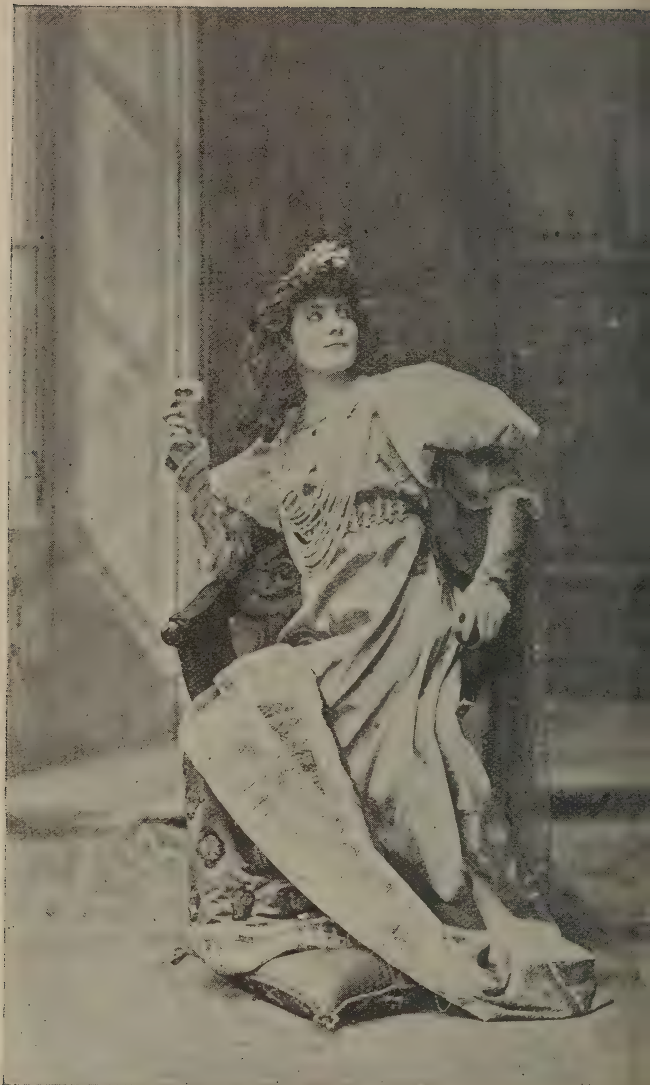

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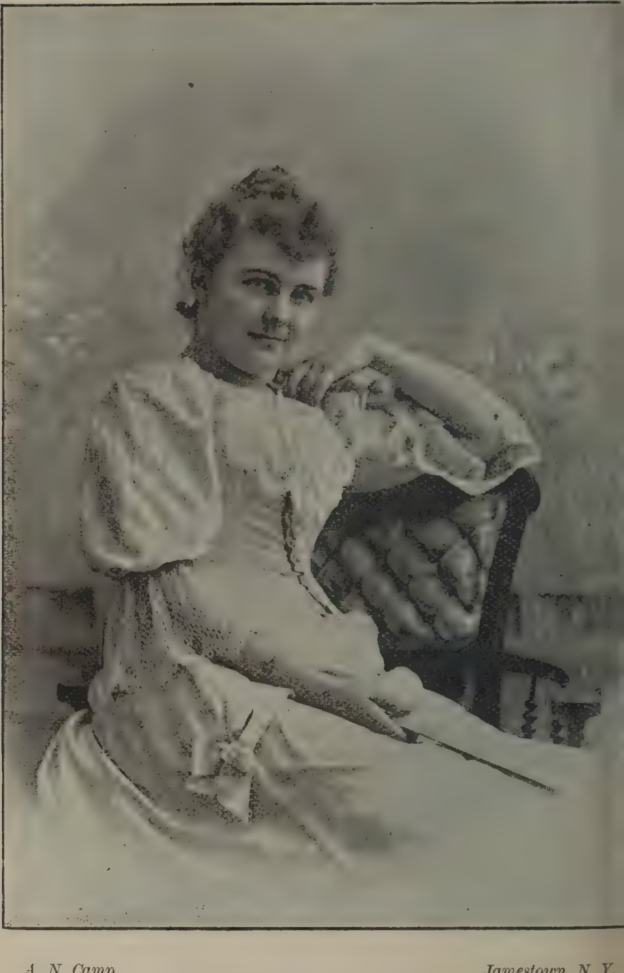

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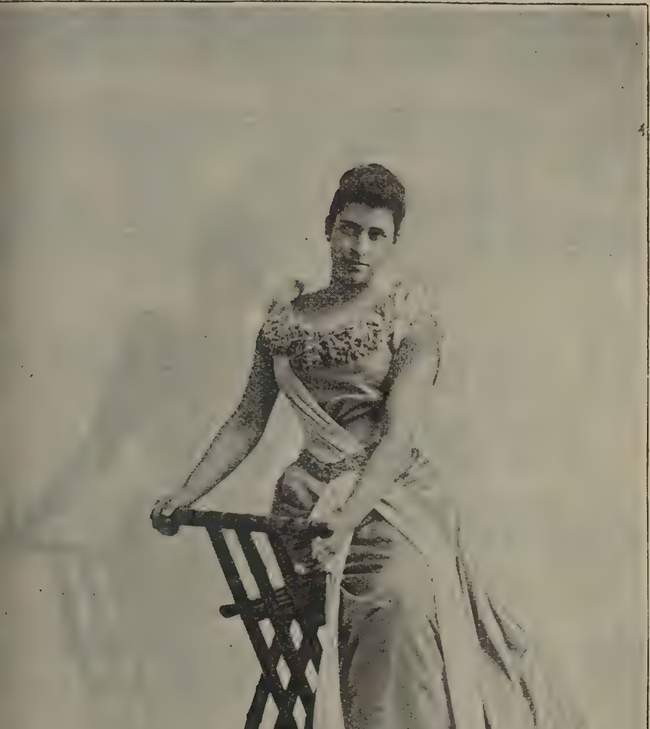

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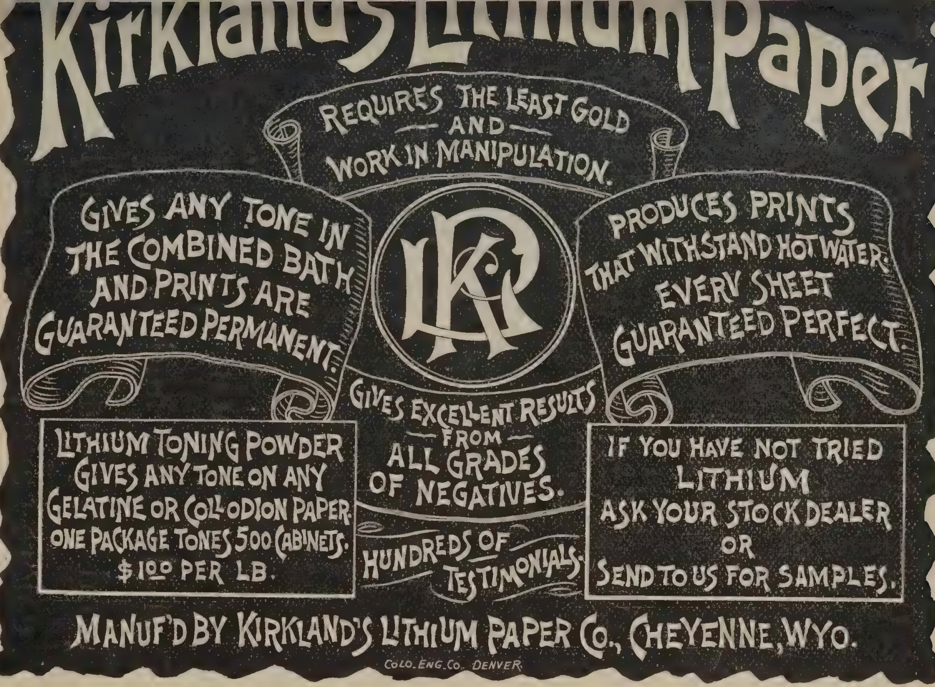

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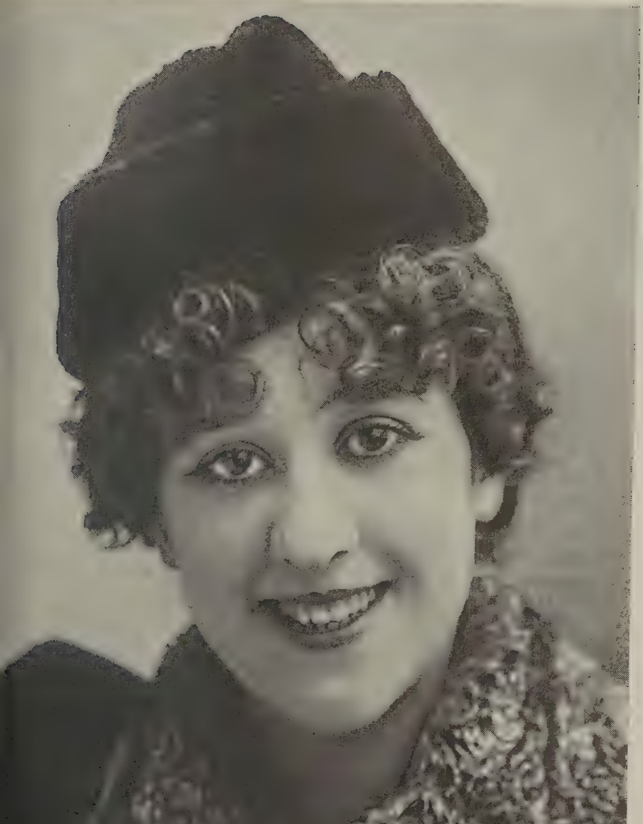

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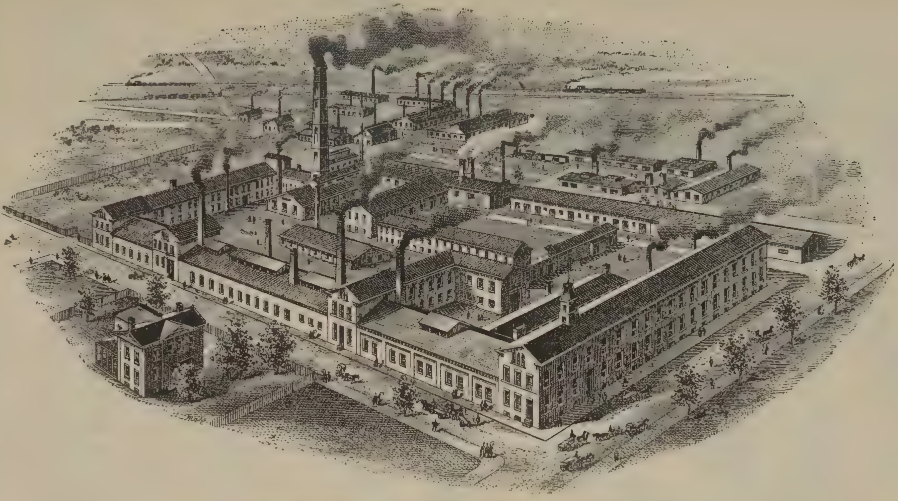

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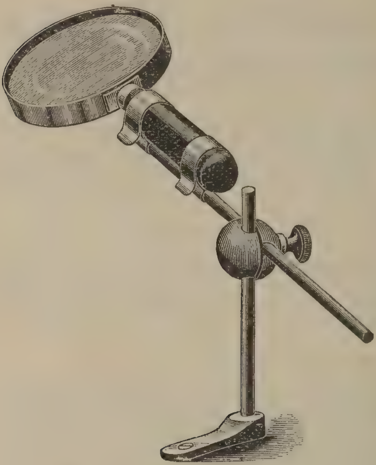

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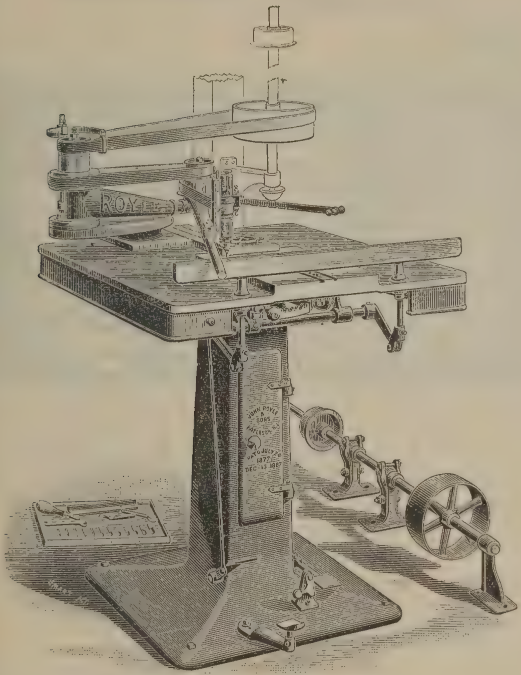
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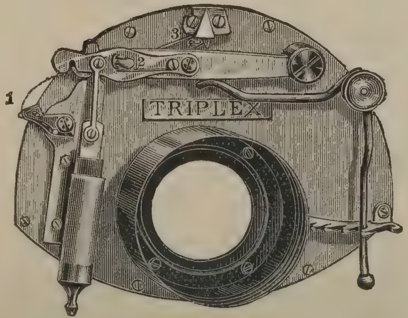

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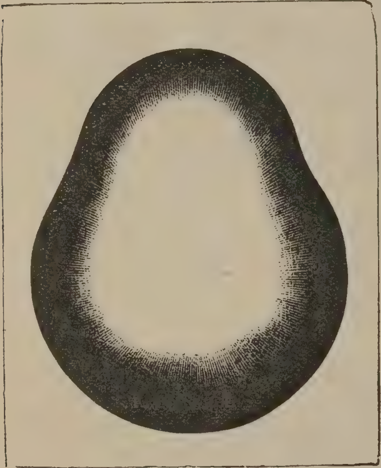

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